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# Experimental Production of Gall-Stones

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## INTRODUCTION

Vast amount of literature exists as to the origin and causation of gall-stones, and much work has been done and is now being done on this subject, especially in regard to its aetiology, diagnosis, and treatment. On the pathogenesis of production of gall-stones three views are current. One group of investigators believes that metabolic error giving rise to hyper-cholesterol-aemia is the primary cause of gall-stones ; others lay a great stress on the stasis of bile ; and the third group of workers claims that bacterial infection of the gall-bladder is the fundamental cause of cholecystitis producing gall-stones. Again, on the nature of the gall-bladder infection a great diversity of opinion exists. Different workers have found results which vary a good deal. Certain facts are, however, well recognised, though many theories have been enunciated and evidences have been brought forward in support of these theories, that biliary calculi can be experimentally produced in lower animals, namely, in dogs, cats and rabbits.

The presence of cholesterol in the gall-stones and in the bile, the association of hyper-cholesterolaemia with the occurrence of gall-stones, and the recognition of the infiltration of lipoid in the wall of the gall-bladder and the presence of cholesterol stones in cholesterosis, suggest a near relationship between the deposits of cholesterol in the mucous membrane of the gall-bladder and the formation of cholesterol stones, which many workers have clinically and experimentally shown to be of great isgnificance.

DEWEY, in 1916, and BLAISDELL and CHANDLER, in 1927, have experimentally shown that in rabbits injections of cholesterol, and also a prolonged course of feeding with cholesterol lead to deposits of this substance in the gall-bladder. In 1929, ILLINGWORTH produced chronic cholecystitis and biliary calculi by feeding the rabbits with cholesterol and simultaneously producing inflammation of the gall-bladder by injections of streptococci. He also demonstrated lipoid deposits in the wall of the gall-bladder by histological methods.

In 1928, WILKI of Montreal experimentally produced cholecystitis and gall-stones only by injections of stroptococci in rabbits and cats. He is one of those who attribute a primary gall-bladder infection, probably blood borne, to be the fundamental cause of almost all types of gall-stones, including even the pure cholesterol monolith, which was formerly regarded as of metabolic origin.

The factor of biliary stagnation has received less attention of late, but it seemed to many that it is more likely that a prolonged stay of bile in the gall-bladder may make the bile so thick that minute particles may be precipitated and form

nuclei for stones. TORINOUMI in 1924, ANDREWS et al, in 1931, and ELMAN and GRAHAM in 1932, have experimentally shown that there is an increase of cholesterol in the bile after ligation of the biliary ducts in dogs ; inflammation of the gall-bladder was also produced in a number of such experiments, but actual biliary concretions are not mentioned to have been formed. In 1931, WESTPHAL et al, however, were successful in producing gall-stones in dogs by such ligation experiments.

## EXPERIMENTAL METHODS AND RESULTS

In view of the role played by hyper-cholesterolaemia alone and also together with the infection of the gall-bladder in the formation of biliary calculi, the following experiments were performed which may be conveniently summarised as follows :

1. When 200 mg. of cholesterol dissolved in 5 c. c. of olive oil was injected daily for 4 weeks into the peritoneal cavity of adult albino rabbits, and 200 mg. of cholesterol daily for 12 to 14 weeks was orally administered to another group of rabbits, the blood cholesterol was found to be increased in all by the fourth week, which was about 200 mg. per cent above normal values. The blood cholesterol was estimated by the method of BLOOR (1916). The average normal value of blood cholesterol in rabbits was found to be 78 mg. per cent. The results of the experiments are shown in Tables I and II. At the end of 6 weeks and 12 weeks the gall-bladders of the rabbits of group 1 and 2 respectively were examined. The contents of the gall-bladders were thick, mucoid bile and debris, which consisted of cholesterol crystals and masses of fats. In three rabbits (Nos. 32, 34 and 35) dark greenish deposits were found in the gall-bladders, and a few of them were found to be adherent to the mucosa. When studied under the dissecting microscope, the villi of the mucous membrane of the gall-bladders were seen to be slightly swollen in appearance. There were no inflammatory changes in any of the gall-bladders.

TABLE I

*Illustrating the effect of the intra-peritoneal injections of cholesterol on the blood cholesterol and upon the condition of the gall-bladder.*

| Rabbit number. | Blood cholesterol mg. per cent | | | | Condition of the gall-bladder. |
|---|---|---|---|---|---|
| | Before injection. | After injections. 2nd | 4th | 6th weeks. | |
| 11 | 65 | 118 | 302 | 140 | Bile thick, mucoid with debris consisting of cholesterin crystals and fats. |
| 12 | 69 | 124 | 235 | 140 | Do |
| 13 | 72 | 139 | 248 | 148 | Do |
| 14 | 80 | 148 | 256 | 180 | Do |
| 15 | 67 | 112 | 252 | 140 | Do |
| 16 | 58 | 146 | 236 | 132 | Do |
| 17 | 73 | 180 | 232 | 142 | Do |
| 18 | 78 | 170 | 230 | 124 | Do |

TABLE II

*Illustrating the increase in blood cholesterol and changes in the gall-bladder after oral administration of 200 mg. of cholesterol per day.*

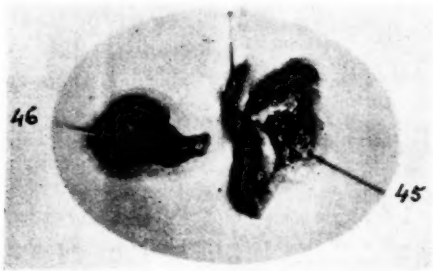
| Rabbit number. | Blood cholesterol mg. per cent | | | | Condition of the gall-bladder. |
|---|---|---|---|---|---|
| | Before choles : | After cholesterol diet. 2nd | 4th | 6th weeks. | |
| 27 | 81 | 120 | 192 | 168 | Bile thick with cholesterol crystals in it. No signs of inflammation present. |
| 28 | 68 | 108 | 112 | 160 | Do |
| 29 | 85 | 168 | ... | ... | Do |
| 30 | 80 | 140 | .. | ... | Do |
| 31 | 75 | 165 | 220 | 200 | Do |
| 32 | 82 | 180 | 240 | 290 | Small concretions present, No signs of inflammation. |
| 33 | 84 | 140 | 162 | 250 | Do |
| 34 | 80 | 160 | 165 | 190 | Do |
| 35 | 76 | 124 | 160 | 180 | Do |

2. Experiments were again performed in rabbits by feeding them with 600 mg. of cholesterol in order to produce a rapid and an excessive increase in the blood cholesterol. Hypercholesterolaemia was indeed found in all, as in the previous experiments, but the increase was not so much as was expected after giving three times the previous dose of cholesterol.

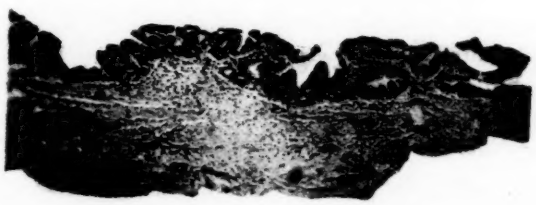
## PHOTOGRAPHIC PLATES

Mucous membrane is distended with lipoid material; the frond like appearance is characteristic; the gall-bladder contained one small stone. Rabbit No. 32 was kept under high cholesterol diet.

Section of a fibrosed gall-bladder in which the mucous membrane was masked by fibrous tissue. One stone of the size of a pea was present. Rabbit No. 45 kept under high cholesterol diet and received B. coli injections.




Thickened gall-bladder of rabbits Nos. 45 and 46, each gall-bladder contains one stone which is of the size of a pea. Microscopic section is shown in the Plates 4 and 5.



Mucous membrane contained lipoid in traces; signs of inflammation were present. A stone of the size of a pea was present in the gall-bladder. Rabbit No. 46 was kept under high cholesterol diet and received B. coli injections.

Normal gall-bladder of a rabbit.

At the end of four weeks the gall-bladders of the rabbits were examined and were found to be normal in all except in two (92 and 93). in which the gall-bladders were slightly shrunken and the microscopic examination showed early signs of inflammation of the gall-bladder. The bile was cultured and was found to be sterile. The inflammation was, in all probability, of an aseptic nature owing to stagnation of thick bile. The bile in all was found to be thick with debris, consisting of cholesterol crystals and masses of fats. There were minute concretions of dark brown colour in two gall-bladders (Nos. 92 and 93). The results are shown in the Table III.

TABLE III

*Illustrating tho effect of oral administration of 600 mg. of cholesterol every day.*

| Rabbit number. | Blood cholesterol mg. per cent | | | Condition of the gall-bladder. |
|---|---|---|---|---|
| | Before choles : | After cholesterol diet. 2nd | 4th weeks. | |
| 92 | 80 | 124 | 180 | Bile was thick, mucoid and had minute dark green concretions. Early signs of inflammation present at neck of the gall-bladder. |
| 93 | 76 | 136 | 200 | Do |
| 94 | 76 | 115 | 172 | Bile was thick mucoid with debris in it. |
| 95 | 66 | 128 | 140 | Do |
| 96 | 60 | 150 | 165 | Do |
| 98 | 82 | 172 | 234 | Bile was thick. |
| 99 | 70 | 184 | 256 | Bile was thick. |

3. In another series of 19 rabbits, eight of which were being treated with intra-peritoneal injections of 200 mg. of cholesterol in olive oil, and the remaining ones by oral administration of 200 mg. of cholesterol, inoculation of B. coli was done—the organisms were cultured and isolated from human gall-bladders. Six weekly injections of B. coli, about 150 millions in 1.5 c. c. of saline, were given into the ear vein of the rabbits which were kept under observation for 12 to 14 weeks. Hyper-cholesterolaemia was found in all as a result of high cholesterol diet. At the end of 12 weeks the gall-bladders of the rabbits were examined and 10 of them were found to be normal ; in 3 signs of inflammation and adhesions were noted, and the other 6 were slightly thickened and shrunken. In most of the cases the bile was thick, mucoid and of dirty grey colour ; there was debris consisting of cholesterol crystals and masses of fats.

Biliary calculi were found in six rabbits. There were minute concretions in 3 (Nos. 24, 25 and 26), which could be seen by naked eye. In one gall-bladder a big mass of concretion was seen to be adherent to the mucous membrane of the gall-bladder ; when studied under the dissecting microscope it was found to be composed of a dark brown nucleus with a yellowish zone at the periphery. In two gall-bladders which were slightly thickened (Nos. 43 and 44) small concretions of grey colour were found, which were the so-called 'mud' in the gall-bladder. There were two large gall-stones formed in two rabbits, one in each, and these stones were like the so-called cholesterol monoliths frequently found in human subjects. The stones were of greenish-white colour and one of them (No. 45) was found to be adherent to the mucous membrane of the gall-bladder at its neck. One of the stones measured 7 mm. x 5 mm. which is quite a big size considering the capacity of the gall-bladder of a rabbit.

The microscopic examination of the gall-bladders showed signs of inflammation in 9 out of 19 rabbits. In many the villi of the mucous membrane of the gall-bladders were found to be slender and swollen, hanging into the lumen. There were patches of small round celled infiltration in the mucous and sub-mucous layers. Fibrosis was very much marked in few gall-bladders, in which the villi arrangement of the mucosa was totally masked, and the wall enormously thickened. The results of the investigations are shown in the Table IV.

The role of pure infection of the gall-bladder as a result of repeated injections of B. coli without being associated with high cholesterol diet is discussed in a paper submitted for publication in the Indian Journal of Medical Research. The

TABLE IV

*Illustrating the changes in the gall-bladder after high cholesterol diet plus repeated injections of* ***B. coli.***

| Rabbit number. | Blood cholesterol mg. per cent Before Exp: | After diet and injections. 2nd | 4th | 6th weeks. | Condition of the gall-bladder. |
|---|---|---|---|---|---|
| 19 | 65 | 208 | Died | ... | Bile thick with debris of cholesterol crystals. |
| 20 | 75 | 230 | Died | ... | Do |
| 21 | 80 | 244 | Died | ... | Do |
| 22 | 74 | 250 | 245 | 110 | Do |
| 23 | 82 | 210 | 256 | 90 | Do |
| 24 | 79 | 192 | 210 | 108 | Bile thick and of dark green colour. Small concretions present. |
| 25 | 85 | 180 | 220 | 80 | Do |
| 26 | 84 | 165 | 116 | 98 | Do |
| 36 | 72 | Died | ... | ... | Normal. |
| 37 | 75 | Died | ... | ... | Normal. |
| 38 | 69 | 100 | Died | ... | Gall-bladder slightly inflamed and adherent to the liver |
| 39 | 76 | 118 | Died | ... | Do |
| 40 | 80 | 108 | Died | ... | Do |
| 41 | 83 | 125 | 140 | 210 | Gall-bladder thickened and shrunken; minute concretions present. |
| 42 | 86 | 130 | 190 | 190 | Do |
| 43 | 92 | 116 | 168 | 204 | Do |
| 44 | 90 | 110 | 150 | 184 | Do |
| 45 | 95 | 108 | 136 | 194 | A stone of the size of a pea present in the gall-bladder which is fibrosed. |
| 46 | 72 | 120 | 134 | 240 | Do |

Nos. 19 to 26 received intra-peritoneal injections of cholesterol.
Nos. 36 to 46 received cholesterol by mouth.

burden of the results is that bacterial infection is capable of producing inflammation of the gall-bladder in the rabbits with the formation of biliary concretions, but the pathological feature under those circumstances is different from what has already been shown by the recent experiments with high cholesterol diet and a coexistent infection of the gall-bladder.

## Summary and Conclusions

To summarise, the cholesterol content of the blood is increased after cholesterol injections and high cholesterol diet—the maximum increase being about 200 mg. per cent above the normal values, and a distinct change in the appearance of the bile is noticed, which becomes thick and mucoid with debris consisting of cholesterol crystals and masses of fats. After a course of cholesterol injections, or high cholesterol diet the gall-bladder may be grossly normal, but concretions in the bile are produced, varying from almost microscopic particles to the size of small peas, especially marked when associated with coexistent infection of the gall-bladder. As a result of a very high cholesterol diet, giving rise to a marked change in the appearance and consistency of the bile, inflammation of the gall-bladder, probably of an aseptic nature, is produced which may be a result of stagnation of the viscid bile. There is evidence that after high cholesterol diet or injection of cholesterol by other routes, precipitations in the bile may be produced which form nuclei for calculi, and a coexisting infection of the gall-bladder hastens the changes in the bile with deposits of solid particles.

The micro-photographic plates of the gall-bladder of the rabbits demonstrate the characteristic changes in the mucous membrane as a result of high cholesterol diet, and also of various stages of inflammation produced after infection. These lesions, I feel justified to remark, are identical to what we find in the inflammatory and calculous diseases of the gall-bladder in human subjects.

In conclusion, while I readily admit that the role of bacterial infection of the gall bladder and stagnation in the flow of bile are of importance, I believe that the histological changes in the gall-bladder as a result of injection of cholesterol in the system, and the viscosity of the bile thus produced considerably influence the precipitation of solid particles which form the nuclei of gall-stones.

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# How to avoid Maternal and Foetal Dangers

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One of the greatest advances that have been made in the sphere of Obstetrics in the recent years is the establishment of careful antenatal supervision with a view to adopting prophylactic measures to secure the safety of the mother and the child during labour. To attain this aim the expectant mother will have to be guided in respect of her food and hygiene, and examined in general to exclude complications and from an obstetrical point of view to determine the presentation and position and to judge of the relative size of the head and the pelvis. In giving instructions regarding food and hygiene the object is that she should keep such good health during pregnancy as to prepare her to pass through the process of childbirth and lying-in-period without any trouble. She should have good nourishing diet composed of milk, fruit, green vegetables, carbo-hydrates, these elements supplying sufficient vitamins, especially vitamins A and D, the former for raising her defensive forces in the organism against infection and the latter for encouraging calcium metabolism so needed during pregnancy not only for her economy but for the proper development of the foetus. Special attention should be directed to her teeth ; a carious painful tooth not only hinders the process of mastication and thereby of digestion but forms a focus from which infection may be carried by blood-stream during the puerperium. A healthy mouth is necessary to keep the body healthy. She must pass every day at least one hour in the open. No excuse can be advanced against it as it can be practised by every pregnant woman, no matter in what rank she is placed in society, inasmuch as it costs nothing and should not cause any inconvenience as it occupies only one hour of the day. It however, enables her to avert such complications as anaemia and toxaemia of pregnancy. In view of this gain, the significance and essential necessity of the passing of at least one hour in the open air must be thoroughly stressed on her mind. She may be enjoined against marital intercourse in the later months of pregnancy to avoid the introduction of septic organisms in the vagina inducing dangerous sepsis in the lying-in-period.

A pregnant woman has to be examined in general systematically to discover any complication arising from pregnancy, such as anaemia and toxaemias of pregnancy, or any morbid condition in connection with other parts of the body, such as lungs, heart, alimentary canal, urinary and nervous systems. The urine of the patient should be regularly examined first at long intervals and then almost every week in the latter period. Blood-pressure record is equally necessary. If any disorder is recognised, it at once presents a problem whether in the interest of the mother or the child the pregnancy should be continued or interrupted. Certain factors have to be considered before arriving at a conclusion. Is the complication such as can be controlled by ordinary measures and the pregnancy may issue in safe termination ? Will the complication assume a grave aspect and produce unfavourable effects on the process of labour or will it threaten the life of the patient long before labour sets in ? These points have to be determined and the decision taken.

Next step is to examine the patient with a view to finding out the presentation and the position. The best time for such an examination is the eighth month because then the liquor amnii has become relatively less and the foetal parts can be distinctly made out. If there is any abnormal presentation such as breech, it can be corrected ; for the breech can then be easily lifted from the pelvic brim and directed

to the fundus. Later on, when the incomplete breech engages the pelvis, as happens in primigravidae, in whom extension of the legs is not uncommonly found, it becomes extremely difficult to disengage the pelvic pole from the pelvis. Further with the extension of the legs, with the relative proportion of the liquor amnii getting progressively less and with the uterine wall coming closer in contact with the child, the turning of it becomes impossible, nay even risky to the child. If the presentation is normal, the location of the back must be ascertained. If the back is in front, it is a favourable situation ; but if behind, it may in a few cases affect prejudicially the course of labour by determining early rupture of the membranes and by inducing extension of the head, the latter being in some conditions arrested in the pelvis. To avert such an issue, the mother may be encouraged to lie always on the side opposite to that where the back of the child is located and to wear an abdominal binder with a pad behind the back of the child, the patient having been instructed as to the exact situation of the pad. These measures may direct the back to the front before the onset of labour.

Attention is then to be directed to determining the size of the pelvis and the size of the head and establishing their relative proportion. This part of the work is very important and must be done very carefully ; because in the light of the information obtained, judgment can be formed regarding the course of labour. The pelvis has to be measured with care, not forgetting to measure the diagonal conjugate, whenever the external measurements are below the average. It is needless to say that rigid aseptic precautions should be observed in measuring the diagonal conjugate. Though the external measurements do not always convey precise information about the pelvic capacity, they may help to form a rough estimation of the size and the shape of the true pelvis. Measurements should be quite accurate, since by knowing exactly the length of the inter-cristal diameter, we can deduce the length of the transverse at the brim by halving the former, the half representing the latter. Knowledge of the transverse space at the brim is of practical importance, inasmuch as if it is over 4½ inches the head finds sufficient accomodation to pass through the brim, provided there is not more than moderate reduction in the conjugate diameter. External conjugate is not very reliable as there are some fallacies connected with it. When a patient is fat, having a thick pad of fat on the pubis in front and over the sacrum behind, it is questionable how much must be deducted from the external conjugate to arrive at the real length of the true conjugate. When pubis is beaked, as in osteomalacia and in figure of eight rachitic flat pelvis, external conjugate measurement is of little use in judging the space from before backward at the brim. External conjugate measures differently when taken while the patient is lying down from what is obtained while standing, the measurement being not infrequently less in lying position. On account of this, it is always wise to ascertain its length by making the patient stand, especially when an accurate measurement is wanted. From the fallacies mentioned above, it must not be concluded that the external conjugate possesses no practical utility. In most of the cases it does furnish a clue for roughly estimating the true conjugate. From the measurements of the external conjugate taken at the Wadia Maternity antenatal department and of the true conjugate on the cadavers in the dissection hall of the G. S. M. College, the average works out at nearly 7 inches in the former and 4 inches in the latter. So for working purposes, 3 inches may be taken as a difference between the two. This basis is of practical use in that it may help to determine whether the pelvis is of minor, moderate or major degree of contraction.

As to the third external diameter, the interspinous diameter, its relation with the intercristal diameter is of importance. Normally the difference between these two diameters is nearly one inch : the interspinous diameter is always smaller, the anterior end of the iliac crest being turned inwards. But in rachitic flat pelvis, the anterior end of the iliac bone being turned outwards and the iliac fossa looking more for-

ward, the interspinous diameter becomes greater and approaches in length to the intercristal diameter. Slight reduction in the difference between these two diameters does not imply much : but when it is half an inch or even less, it necessarily indicates the flattening of the pelvis.

Here it may be mentioned that the general practice at the antenatal clinic is to take measurements of the pelvis in a primigravida only and to feel no necessity at any time to have them in a multipara. It is hazardous always to suppose in this way ; for in normal pelvis nothing untoward may happen but if the pelvis is small and proper obstetric history about previous labours has not been given by the patient, nor elicited from her, the real state of affairs may be detected when it is too late to adopt the suitable remedy. To prevent such an unhappy occurrence, whenever it is noticed that in a multigravida the head cannot be made to engage the pelvis, the latter should be measured and the measurements considered along with the obstetric history obtained from her. These steps will put the medical men on the right track.

Having ascertained the dimensions of the pelvis, the next procedure is to determine the relation between the size of the pelvis and the head. This is more important than mere taking the measurements of the pelvis. If the proportion between the two is normal, labour is likely to run the normal course. It cannot be said positively that the course will be normal because of the uncertainty of the uterine force. In forcing the passenger out of the passage, the uterus plays a prominent part. If the uterus is possessed of its usual strength and acting normally, and the pelvis and the child possess the normal proportion, labour is sure to run usual course. It is therefore quite obvious that the uterine force forms a third factor in determining the fate of labour. Since it has such outstanding influence on the course of labour, it must always be considered in conjunction with the other two factors. If the proportion between the passage and the passengers is normal and the uterine force governing the process of labour is normal, the labour is normal ; if there is any variation in any one of these factors, labour is unfavourably affected. If there is any alteration in the normal relation, which may occur when the pelvis is small or the child is unusually large, and if the uterus at the same time contracts but as usual the labour will be prolonged and at times may not end spontaneously and may even call for artificial aid for its termination. But nature is kind enough to effect natural delivery by increasing the uterine force, the uterus performing greater work and contracting more forcibly than in normal easy labour. The organ can perform the extra work thrown on it so long it has its original inherent strength ; but each pregnancy leaves behind a certain amount of weakness in its walls. This effect is more marked when pregnancies follow each other in rapid succession. This accounts for those cases of slight or moderate degrees of pelvic contraction, in which there may be spontaneous deliveries in the earlier childbirths but in which in the later deliveries there is obstruction. It is not unusual to find in these cases that on the occasion of the eighth or ninth delivery labour may be unduly prolonged and sometimes it has to be terminated by means of forceps. Under the circumstances the uterus has failed to effect delivery for want of proper strength, though on previous occasions nature could evoke powerful and sustained uterine contractions enough to cope with the work. However there are no clinical means by which the force of the uterus can be measured, though previous obstetric history will supply the necessary information regarding its action in former labours.

We have therefore to depend upon determining the size of the pelvis and that of the head and thus establishing the cephalopelvic proportion. We can measure the pelvis and judge of its size but measuring the head is difficult as no landmarks can be taken on it since it does not invariably present in one position only. Besides landmarks taken on the head in anterior positions will be of little use when applied for posterior positions. So we have to rely on the relative size of the head and the

pelvis. First we must recognize what proportion is there between an average-sized head and a normal pelvis. The head lies loosely in the pelvis. This can be readily demonstrated by taking the bony pelvis that we receive from the West for demonstration to the class and holding in it the skull received along with it and possessed of average dimensions, when it would be at once noticed that the pelvis was too big for it. It is one of the instances of nature which proves that she is always very bountiful in her gifts. She has generously provided with a wide passage. It is so wide that not only is a child of average size born easily but even one much above the average comes out comfortably under favourable conditions. This is the reason which affords explanation for normal easy labour in the overwhelming majority of cases. But unfortunataly certain factors prevail which baffle nature. They produce prejudicial effect on the formation of the pelvis and cause reduction in its size. These factors consist in diseases such as rickets in childhood, osteomalacia in adults, affection of the sacro-iliac joint, hipjoints or of the spine ; in trauma, resulting in dislocation of the hip-joint or spinal vertebrae ; and in defect in development, producing split pelvis. Again city life has harmful effect on the growth of the pelvis, inasmuch as the incidence of the pelvic deformity is greater in urban than in rural districts. With these factors operating, the pelvis does not retain its normal capacity, distinguished by margin of space. Diminution in size occurs ; it may be minor, moderate or major. In minor degree, the pelvis does not possess its margin of space. It is just enough for the child to pass through. In moderate degree, the space is small for the child and spontaneous delivery can occur only after the head has undergone reduction in its size by moulding to accomodate itself to the passage. In major degree of pelvic contraction, the passage is too small for the child to pass through and so birth through natural passages is never effected. It follows that by determining the size of the pelvis, judgment can be formed about the behaviour of labour. But it is not the only factor upon which labour depends, as can be easily recognized from what has been said before. Another essential factor influencing labour is the size of the head. Its exact size cannot be easily measured but its relative size with the pelvis can be determined. This can be ascertained by noticing how the head lies in relation with the pelvis. For this purpose the head should be examined between two hands over the pelvic brim for ascertaining whether the head is engaged in the pelvis or is engaging or lying free above the brim. The head is regarded as engaged when the greater part of it is below the pelvic brim ; whereas when the greater part is above the brim while a small portion has descended in the pelvis, the head is engaging ; but when no part has passed the brim, the head being freely movable from side to side, it is floating. The best time to make this examination is the thirty sixth week. Then for the sake of convenience these obstetric cases may be distinguished into four classes A, B, C, D, according as the head is engaged, it is engaging, it is slightly overlapping the brim or much overlapping it. In cases of the A class the pelvis and head possess the normal proportions, and the head is almost invariably engaged. When this is found it is a sure indication of labour, occurring normally aud easily. Here it may be mentioned that though in primigravidae with normal cephalo-pelvic proportion the engagement of the head is the rule, it is also not uncommon to find the head engaged even in multigravidae. This fact may be noticed in his daily routine by anyone, working in the antenatal clinic after having shaken off the old traditional bias that in multipara the head is always floating and is engaged only when labour has set in. Another fact which would be noticed by any careful clinician is that in primigravidae the head is engaged not a fortnight before labour, as stated in books but much earlier, the head appearing engaged even from the seventh month. In connection with this, certain anomalies in the engagement of the head will have to be considered. In few cases of

primigravidae, though the pelvis virtually possesses average measurements and the head, too appears to be of average size, the latter is felt not engaged. In some this non-engagement is in consequence of marked lordosis of the lumbar spine, which pushes the head forward and prevents it from fitting in the brim. However in the early stage of labour, the uterus drives it on the brim past the convex spine and the head then soon gets engaged. Another cause which stops the head of average size from entering the normal pelvis is an extraordinary deposition of fat in the extra peritoneal tissue and in the cave of Retzius. In this case the head descends in the pelvis no sooner in the first stage of labour are the cervix and lower segment of the uterus raised from the pelvis, lifting along with them the bladder and the extraperitoneal tissues in contact with the lower abdominal parieties. In occipitoposterior position, if the head is smaller than the average, it descends in the pelvis and is engaged. If it is an average-sized head, the bulk of it is felt above the brim, partly because of the slight extension of the head in the posterior position and partly because of the anterior part of the head being directed forward, it can be felt over wider extent than when occiput is to the front. As the head is flexed, though not completely, and the sinciput is located in front, it is felt at a higher level than the top of the symphysis pubis. When the examining fingers are run from over the head on to the pubis, the head appears to overlap it. But it is apparent, not real. During labour, as the flexion is completed, overlapping disappears and the anterior surface of the head comes to lie within the pelvis by the time the occiput is reaching the pelvic floor.

In multiparae the head may be floating or engaged though cephalo-pelvic proportion may be normal. This variation depends upon certain factors. In some multiparae, the abdominal wall may be rigid and only a few lineal gravidarum noticeable ; whereas in others, the wall may be lax, the recti muscles separated and many lineal gravidarum seen. In the former the protrusion of the abdomen is less marked while in the second class of cases the abdomen is more prominent, the fundus falling forward. In the former, the uterine axis bears almost nearly the normal relation to the pelvic axis while in the latter this relation is disturbed. Besides children in subsequent pregnancies are generally heavier. These are the factors which direct the engagement of the head in multiparae. However in good proportion of multiparae, is the head engaged. If not engaged, it can be made to descend into the pelvis by pushing it in that direction by both hands, sometimes with the help of anaesthesia.

It follows that with average-sized head and average-sized pelvis, engagement of the head is noticed in most of the primiparae and many of the multiparae. When such a condition is found out by abdominal palpation, the cases are classified under class A. They can be at once set aside as those in which normal labour is anticipated.

The other class of cases which affords little difficulty in recognizing is the one in which there is so great an overlapping of the brim that the delivery of the child through the pelvis is impossible. These cases are grouped under class D in the routine examination done in the thirty sixth week. They are destined for Caesarian section at term.

It is the cases of the B and C classes which call for great judgment derived from experience. The cases of B class are those in which the head may be already engaging or may be made just to engage by pushing it towards the brim. The essential feature of this class is the cephalo-pelvic proportion which is such that the passage is barely sufficient for the child. The pelvis is devoid of the margin of space ; its antero-posterior space at the brim is not less than $3\frac{3}{4}$ inches ; the child as it travels through the passage, lies not loosely as is found in the A class but closely fitting to it. The uterus has to do more work in effecting child-birth than with cases of the A class. In most of the cases it proves quite competent to carry out the work. In some its strength may begin to fail towards the end and then it has to be relieved by means of forceps. In very few cases of multiparae the

head may be arrested high up in the pelvis, and in order to avoid grave injuries to mother's soft parts, the child has to be sacrificed. With such an obstetric history in the previous labours of such a multipara the question of induction of labour or performing prophylactic version at the onset of labour or Caesarian section at term with sterilization of the patient, if she has children, arises in the next pregnancy.

The class C comprises those cases in which there is overlapping and in which the head enters the pelvis during labour after having undergone reduction in size by moulding. These cases can be recognized in the thirty-sixth week by pelvimetry and by the combined abdominal and vaginal examination by MUNRO KERR'S method. In this type of case, the conjugate diameter ranges between 3 and $3\frac{3}{4}$ inches and the external conjugate diameter may measure 6 and $6\frac{3}{4}$ inches. When the head is grasped by both hands and pushed towards the brim, it does not pass within it but is found to overlap the symphysis pubis. The degree of overlapping is distinguishable more readily by MUNRO KERR'S method in which the fingers in the vagina can feel how much the head descends in the pelvis while the thumb held over the top of the pubis shows how far the head overlaps its posterior surface. This overlapping may be slight, moderate or much. These results obtained by bimanual examination may be controlled by radiograms, taken at this time. In a radiogram we can compare the size of the head with the space of the pelvis. The head may look equal in size to the pelvis, or slightly larger or much larger than it. In a radiogram we can judge of the size by noticing how far the head overlaps the sides of the pelvis. Here may it be said that one fallacy has to be borne in mind while examining a radiogram. If the flexion of the head is deficient, it may show much overlapping of the sides of the pelvis, a greater proportion of which disappears when flexion is induced during labour. Deficient flexion can be readily recognised in a radiogram by comparing the level of the occipital protuberance and the forehead pro minence. If the latter is only a little higher, it indicates deficiency of flexion. If the head is well flexed, yet there is much overlapping of the sides, it is of grave import.

The overlapping is slight when the case approaches the B classs, in which there is no disproportion between the head and pelvis, the former just fitting the latter ; it becomes greater as the case comes closer to the D class, in which the head feels too large for the pelvis and the pelvic dimensions too are very small. Between these two varieties of cases, stand a class of case in which the overlapping is moderate. Now if labour be prematurely induced it may run a different course according as the degree of overlapping is slight, moderate or much. When slight, the labour will run an easy course and a premature child be born without aid. If moderate, the head has to undergo reduction in size by moulding when only it progresses through the pelvis and the child is born naturally or sometimes by the help of forceps. When overlapping is much, the head has to be reduced much in size by severe moulding, before it can pass the brim and descent through the pelvis. Owing to such excessive and almost pathological moulding, the cranial contents may sustain injury and the premature child may be still-born or extracted dead. So these cases of much overlapping *i. e.* those which can be classified between C and D should be also set aside for Caesarian section at term ; because if in the thirty-sixth week the prospect of getting a living chid is so slender, it will be still worse at term.

It can be readily understood that the question of determining the premature labour can be considered at the thirty-sixth week in those cases of C class in which there is but slight or moderate overlapping, the cases of more than moderate overlapping being unfit at this time for induction of labour. In the last group to get a living child, labour should have been induced earlier than the thirty-sixth week ; but it has been found out by experience that the children born earlier than the thirty-sixth week possess meagre chances of surviving. The prospect of surviving after birth on the other hand improve as more days pass and induction in the thirty-eighth week

is followeed by best results. In slight overlapping the case may be allowed to proceed a week longer, when an examination is again done ; if the disproportion has not much increased, the determination of labour may be postponed until the end of thirty-eighth week. In the case of moderate overlapping in the thirty-sixth week, such delay cannot be practised, and the induction should be undertaken at once ; otherwise the labour would be obstructed if induced later. Premature children demand assiduous care in rearing them, entailing the employment of a nurse for constant attention, an expense which all cannot afford to bear. So these cases of slight or moderate overlapping are reserved for trial labour. Many of them end favourably with a living child offering a fair promise of survival. In Wadia Hospital since the beginning of this year, nineteen cases were systematically earmarked for trial labour. All but one ended in spontaneous labour. In that one case, forceps was applied when the head reached the perineum. The head may be found in these trial labour cases to engage a little before the onset or in the early stages of labour or after the rupture of the membranes in the second stage. Of nineteen cases assigned to trial labour, in fifteen the head engaged before rupture and in four after rupture of the membranes. Of the fifteen engaging before the bursting of the bag, eight were found to enter the brim under seven hours and in eleven between seven and eighteen hours. These cases of trial labour must be supervised very carefully and Caesarian section should be anticipated long before any bad effects of hard labour are produced either on the child or mother ; otherwise the operation may not be followed by desirable results. In trial labour cases, lower segment Caesarian section is safer and should be done in preference to the classical section. Trial labour is more indicated in primiparae, inasmuch as in multiparae the behaviour of previous labours does furnish the necessary information.

## Conclusions

(1) Antenatal care consists in guiding the expectant mother in preserving her health, in encouraging her to come to the hospital when slight abnormality is noticed, in recognizing any complication in time and deciding the line of treatment, and in judging the prospect of labour by finding out presentations and positions and the cephalo-pelvic relation.

(2) For deciding the relation between the head and the pelvis, engagement of the head may be taken as a determining factor.

(3) According as the head is engaged or not, obstetric cases may be divided into four classes A, B, C, and D.

(4) In cases of A class, the head is nearly always engaged in primiparae and not uncommonly in multiparae, the greater part of the head being below the brim. The pelvis is large for the child.

(5) In B class, the child is closely fitting the pelvis and may be even engaging already or may be made to enter the pelvis by pushing towards the brim ; yet the greater part of the head is felt above the brim.

(6) In C class, the head is free above the brim ; and when pushed over it, it is felt to overlap it, but not to the extent as to preclude descent of the head into the pelvis after undergoing reduction in size by moulding. The moulding that is induced may be slight, moderate or excessive. It is slight in the cases approaching B class and excessive in those nearing the D class. In the latter the moulding is pathological, causing so much injury to the cranial contents that the possibility of getting a living child is very little. When slight, the head is delayed at the brim for some time but is found to enter it in the early stages of labour and to make progress through it and the child may be born spontaneously or with artificial aid. In moderate moulding, the head is held up at the brim for a long time and it may enter it some time after the membranes have ruptured. More frequently artificial aid is needed in effecting delivery, being either forceps or even symphisiotomy or pubiotomy. If the head fails to enter,

| X-Ray No. | When X-Ray was taken | Para | Age and Conf. No. | Measurements | Type of Pelvis | When head began to engage | When the membranes ruptured | When the child was born | Character of pains | Duration of Labour | Art. interference |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 2 days before delivery | I | 22<br>88 | 8½ 9¼ 6¾ | —<br>Flat<br>Head equal in size to the Pelvis.<br>B | (1) On admission 2 days before delivery the head was floating<br>(2) 3 hours after labour pains, head began to engage.<br>(3) 10 hours after onset of labour head low-down.<br>(4) Deficient flexion. | 11 hours after onset of labour. | 1 hour 4 minutes after rupture of membranes, | Normal. | 12 hours. | Nil. |
| 7 | 1 day before delivery | I | 17<br>139 | 8 9½ 6¾ | Flat.<br>Head equal in size to the Pelvis.<br>B | (1) One day before delivery head floating,<br>(2) On admission head fixing. P. R. Membranes not felt. Os 3 fingers. | ? | 11½ hours after onset of labour. | Normal. | 11½ hours. | Nil. |
| 9 | After the onset of labour | II<br>1st F.T.<br>S. B | 22<br>190 | 9½ 10¼ 7¼ | Head larger than the Pelvis. Head shows moulding<br>C | On admission head floating with deficient flexion. Head began to engage 1½ hours before rupture of membranes. Head was low down when the membranes had ruptured. | 4½ hours after onset of labour. | 27 minutes after rupture of membranes, | Stronger than usual. | 5 hours. | Nil. |
| 14 | 4 days before delivery | I | 18<br>606 | 9¼ 10¼ 6¾ | Type ?<br>Head equal to the size of the Pelvis.<br>B | Head floating 4 days before delivery,<br>On admission i. e. 8 hours before delivery head fixing.<br>1¼ hours before delivery head low down. | 5 hours after onset of labour. | 3¼ hours after rupture of membranes, | Normal. | 8¼ hours. | Nil. |
| 28 | 1 day before delivery | I | 20<br>805 | 8¾ 9¾ 7¼ | Slight lumbar lordosis. Deficient flexion.<br>L. O. A.<br>B | At the onset of labour head floating. Six hours after onset head fixed. | 8¼ hours after onset of labour. | 49 minutes after rupture of membranes. | Normal. | 9½ hours. Quinine and castor oil method of induction on that day. Pt. being 15 days post-mature. | Nil. |
| 36R. | After the onset of labour | I | 19<br>1006 | 7½ 8¾ 6½ | Flat<br>C Class<br>R. O. P.<br>Deficient flexion. | 4 hours after onset of labour head floating.<br>7 hours after onset of labour head fixing.<br>9 hours after onset of labour head low down. | 11 hours after onset of labour | 43 minutes after rupture of membranes. | Normal. | 12 hours. | Nil. |
| 43 | 29 days before delivery | I | 18<br>1135 | 8½ 8¾ 6½ | G. C. P.<br>B | Head floating 3 weeks before delivery.<br>On admission i. e. 15 hours after onset of labour head fixing.<br>½ hour before rupture of membrane head low down. | 19 hours after onset of labour. | 27 minutes after rupture of membranes. | Pains in the 1st stage rather weak. | 19½ hours. | Nil. |

lower segment Caesarian section may have to be done.

(7) In the D class of cases, the disproportion between the head and the pelvis is so great that the child will not enter the brim and the delivery of the child through natural passage is impracticable.

(8) In cases of A class, the parturient uterus has to do very little work in expelling the child because the head is at ischial spines on full dilation of the os.

(9) In cases of B class, the uterus has to do more work since the head is in the upper part of the pelvic canal when the os is fully dilated and the organ has to force the child through the greater part of the parturient canal than in the case of the A class.

(10) In cases of C class, the uterus has to perform a great amount of work in that it has to induce moulding of the head first before the latter can enter the pelvic canal and has to force the child through the whole of the birth-canal. In negotiating this work, the organ may in many cases succeed or even rupture in some-

(11) In cases of D class, the uterus can never force the head even in the inlet of the parturient canal. If such cases are not recognized in the later months, and labour is allowed to proceed, the uterus contracts more and more powerfully till at last it many rupture, the head still floating above the brim.

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# Present Position of the Treatment of Pulmonary Tuberculosis

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There is no cure for tuberculosis but the arrest of the disease is effected by the agency of those immunising forces, which are inherent in all organisms, and the main object of the treatment is to help and develop these forces which will destroy the specific organism or will neutralise its action or shut off from the body areas of the disease in which it may be present.

Today the treatment of pulmonary tuberculosis is not simple, but many-sided and demands a great deal of attention and knowledge on the part of the practitioner. There is no one particular measure or cure which can be considered supreme in this disease and one should take help of all the developments both in its diagnosis and treatment.

Since the days of BODINGTON when he advocated open air treatment for pulmonary tuberculosis there have been revolutionary changes which one can divide into three periods :

(1) The Sanatorium Treatment (1840-1890)
(2) The Specific Treatment (1890-1910)
(3) Collapse Therapy (1910-1932)

## THE SANATORIUM TREATMENT

This comprises of rest, diet, fresh air, sunshine.

*Rest.* Absolute rest, as in typhoid fever as long as the temperature is present and after it is normal for some time, has proved successful in many cases. The patient must be properly comfortable with mental ease and few visitors should be allowed. Postural rest by lying on the side affected as well as by means of various splints and compression devices have also been useful. Collapse therapy also aims at the same result by giving rest to the affected part of the lung and allowing it to heal.

*Diet.* OSLER emphasised that the cure of tuberculosis is a question of nutrition and this is particularly true in this country where general poverty and insufficient nourishment prevail on

a large scale. Even those who can afford, are taking a faulty dietary and specially in cities, artificial dietary is adopted, giving poor nutrition, undermining vitality and producing many diseases. The maintenance of nutrition is one of the most important object to be kept in view and every patient should be induced, to take plenty of nourishment and to increase in weight; besides ordinary meals, milk, cream, butter and fresh vegetables and fruits such as bananas, papaya, chikus, mangoes etc. should be taken in plenty. Cod liver oil and vitamins should also be taken. Salt free diet as advocated by GERSON is useful but to a limited extent in pulmonary cases.

*Fresh air and Sunshine.* The patients should be kept constantly in open air or in covered sheds open on two sides and protected from storms and winds. There are plenty of places in India, where there is abundant sunshine and low humidity and every province has some good places; mere change of climate is no good and it is far more necessary that there should be good food, absolute comfort, peace of mind and suitable medical attendance. All these can be obtained in a special institution called a sanatorium and it is in the sanatoria in the West that all the principles and details of the autoinoculation treatment of tuberculosis have been worked out and spread throughout the profession and the public. These principles besides those mentioned above, of rest, fresh air, nourishing food, also include graduated exercises after the temperature is normal, beginning from short walks to gardening, digging, singing and heavy work so as to make the patient fit to do his duty and earn his living. The cases can be treated on these principles also at home or in hospitals. The most suitable climate for these cases is the dry warm weather with low amount of rainfall. It must be uniform also without any extremes of heat, cold or rain. There are plenty of such places in India, but they are not properly known and some places have got such reputation in a haphazard way. There are hardly one or two sanatoria in the whole of India working on modern lines. There are a few 'so called sanitariums' built by misguided charitable persons which are really (sanitary places for people not tuberculous) to go and have change of climate; some meant for the tuberculous are closed for 3 or 4 months in the year owing to excessive cold or rain.

The above objects can be achieved by (1) Improved economic conditions and housing (2) Better education in personal hygiene and improved sanitation (3) Improved medical education and improved medical training of medical men in the early diagnosis and treatment of pulmonary tuberculosis (4) Establishment of combined tuberculosis hospitals, colonies and sanatoria for the isolation and treatment of cases and removal of the source of infection.

Every large city ought to have an up-to-date Tuberculosis Institute with all the necessary X-Ray, pneumothorax and other apparatus nearby on a hill in the suburbs, a marine sanatorium for gland, bone, joint and surgical tuberculosis and a village settlement for the patients to settle down to some occupation after they have recovered. These can be easily provided in the suburbs outside a city like Bombay in the form of a garden colony with farm, workshop etc. for convalescents. These institutions are also of great educational value, because once these patients are made to understand the mode of life prescribed in these institutions they carry these principles everywhere.

### SPECIFIC TREATMENT

There is no specific remedy either biological or chemical discovered which will destroy tubercle bacilli. KOCH introduced tuberculin treatment in 1890 for tuberculosis and then there have been so many products in the market, all being its different variations by different people, that one is at a loss to understand whether any of them is any good. All of them produce inflammatory reactions in the tuberculous focus and the products of these reactions induce autoinoculation and severe reactions. Old foci are lighted up into a severe or military type: one had seen such bad results in cases here, where people's resistance is so poor and the

disease flares up so rapidly, that one cannot but condemn too severely those who deliberately expose the patients to such a risk.

The methods for specific treatment are :

(*a*) Active immunization by tuberculins and other bacillary products.

(*b*) Passive immunization by serums of animals actively immunized, viz. MARAGLIANO'S and SPHALINGER'S serum.

(*c*) Passive active immunity treatment of SPENGLER by means of immune substances.

It is [1] not surprising that the tuberculin treatment ushered in with Koch's excellent credentials excited the liveliest interest in all civilized countries, and the hope was freely expressed that now at least one of the greatest scourges of the human race would be brought under control. The commotion roused in the medical world was incredible. Nothing like it had been seen since the South Sea Bubble in 1720. A veritable stampede to Berlin ensued, doctors and patients flocking in frantic haste from all quarters of the globe to the new pool of siloam.

Observers in all countries had no difficulty in convincing that tuberculin had a powerful effect on tuberculous subjects. The local results were strikingly manifested in cases of lupus where the hyperaemia and swelling of the affected skin could be watched from day to day. Physical examination of the lungs in pulmonary cases pointed to similar effects on the lungs. But in accordance with KOCH'S instructions when the dose of tuberculin was gradually increased, constitutional symptoms of severe nature were frequently excited with fatal results in many instances. In very few cases only, permanent improvement was secured.

In a comparatively short time the failure of tuberculin treatment had to be reluctantly admitted and KOCH'S method of administration was virtually abandoned, though a faithful few never ceased to advocate the practice of it. After a time many workers in Germany and in other countries began to use tuberculin on a different principle.

KOCH thought that tuberculin should be given in increasing quantity until a high degree of tolerance was attained. This was assumed to indicate that all active tuberculous foci had been destroyed. The new school employed minute doses, continued over long periods of time, but so gradually increased as to avoid all constitutional reaction. In SIR A. E. WRIGHT'S cases the results were controlled by observations on the index of the leucocytes of the patient's blood, a method devised by himself. This plan of administering tuberculin was given a prolonged trial. But in the case of pulmonary tuberculosis, the results were disappointing. Better results have attended its use in the case of chronic tuberculosis of lymphatic glands, bones and joints. Various other preparations of tuberculin made from human, bovine and other sources have been tried without success. Attempts were made by other workers to produce a passive immunity in tuberculous subjects by means of serums derived from actively immunized animals, but with no better results. The toxin of tuberculosis is an endotoxin and is bound up with the cell body of the bacillus. The object in view is the production of antibodies in infected organisms. But seeing that Nature herself is already hard at work manufacturing antibodies, it is difficult to define the stages at which the artificial stimulation of antibody formation can be usefully undertaken. It is easy to do more harm than good by injudicious attempts to supplement the natural forces of reaction to bacillary invasion. It must be confessed that the failure of tuberculin has been a great disappointment.

There seemed to be little hope of the discovery of any drug that could destroy the bacillus without damaging the delicate tissue cells. Add to that the difficulty of any drug reaching the microbes securely entrenched in masses of necrotic tissue and shut off from vascular and lymphatic connection and one can picture to oneself the hopes raised by KOCH'S memorable proclamation of the powers of tuberculin. But in spite of the meagre results of tuberculin treatment it is probable that KOCH'S researches

indicate the lines along which ultimate success may be achieved. It has been shown that a tuberculous patient may acquire a high degree of tolerance to tuberculin without any corresponding improvements in his malady.

DR. YOUNG [2] in his Lettosmian lectures on the treatment of pulmonary tuberculosis before the Royal College of Physicians remarked some time ago as follows about tuberculin treatment :

Tuberculin treatment, since its introduction by KOCH has suffered more from the zeal of its advocates than from the criticism of sceptics. Undoubtedly the best results have been obtained in the surgical forms of the disease with simpler preparations such as old tuberculin ; 'T. R' and bacillary emulsions ; its value is less in pulmonary cases. It was recognised that immunity or tolerance might be secured and yet co-exist with rapid extension of the disease as was shown recently by SIR ALMROTH WRIGHT. DR. YOUNG dealth next with bacterial 'fractionisation' with reference to the work of DEYCKE and MUCH and drew attention to DREYER'S treatment of the bacilli with formalin, acetone, grinding and centrifuging, a thick suspension of defatted bacilli was finally prepared. Another "Defatting" method employed in Germany made use of trichlorethylene. DR. YOUNG felt more convinced of the power for harm of tuberculin generally than of its power for good, but agreed that cautious use would sometimes result in the drying up of sputum and complete arrest of the disease in some patients, who though improved, had not fully recovered. At present, however, the omens are not favourable for the future as regards its use in pulmonary tuberculosis. With regard to serum treatment, this was less encouraging than vaccine treatment. Since the preparation of the first serum ( that of MARAGLIANO and that of MARMORCK), 18 different serums had been produced. The full details of the SPHALINGER method of preparation were still unpublished. Some encouraging results of its use had been reported, but the data at present were insufficient for judgment. There were few adherents of the SPENGLER I. K. THERAPY now. Vaccine treatment for secondary organisms was much in favour at present. At times autogenous vaccine seemed to be good, and an interesting note had been published by WINGFIELD, who found streptococcal vaccines of considerable service. DR. YOUNG had been able to confirm WINGFIELD'S observations.

POTTENGER[3] in his treatise says, personally I would not recommend tuberculin to be used in cases of acute tuberculosis with fever except by those who have had long experience in its use, because it requires greatest judgment and caution and like a two-edged sword, it may cut both ways ; clinically there is a considerable doubt as to its efficiency, if one considers the opinion of all observers.

The favourable effects noticed in glandular, surgical and in early acute cases of pulmonary tuberculosis are obtained only when vitality of the body or the vitality of the tissues is strong enough to withstand the hypersensitiveness produced by these products.

We see that the majority of tuberculous cases come here, when the disease is acute and extensive, the vitality of the tissues is altogether shattered and the immunity machinery is broken down. Looking to all the above facts, it is hardly likely that any form of tuberculin will be justified to be used in these cases, and and no wonder, more harm is done than good even with extreme skill, care and attention in the treatment.

As a prophylactic agent tuberculin has proved a success. CALMETTE has recently introduced prophylaxis by means of oral doses which may be of use in children exposed to massive infection.

As a diagnostic agent (by VON PIRQUET and MANTOUX TESTS) specially in young people and also to adopt other prophylactic measures it is invaluable and has been recommended by high authorities. SIR ROBERT PHILIP [4] in his recent Malcolm Morris Memorial Lecture remarked as follows :

FUNDAMENTAL VALUE OF TUBERCULIN

"Having regard to the likelihood of infection in the course of childhood, and the difficulty

of assessing the ultimate consequences of such infection, I am firmly convinced that the general use of tuberculin as a diagnostic agent in childhood, is most desirable. Because of the likelihood of infection, the tuberculin test should become routine practice at stated intervals from early infancy onwards. The procedure is painless and harmless, yet the knowledge obtained by it is priceless.

So long as the reaction remains negative, nothing further is necessary. Whenever a positive reaction is obtained for the first time, the fact and the date should be recorded. The fact of tuberculization and the date of its first detection are of immense significance in the life-history of the child, having regard to the possible implications.

If after positive determination, the health of the child continues thoroughly good, we have the knowledge that the child's resistance is sufficient, and there is no call for treatment. On the other hand, the positive determination may illuminate many after-events. Vague conditions of "delicacy" in the child may find their explanation –for example, in malnutrition, obscure feverish attacks, ill-defined lack of energy, so-called "disturbed action of the heart," which may interfere with the claims of education and sport. Such conditions, I am satisfied, are very frequently the expression of tuberculous infection. Further, the occurrence of incidental illness such as measles and whooping cough will call for watchfulness, and care will be taken to secure complete convalescence after such attacks. The doctor will insist on the maintenance of a high level of resistance, more particularly in relation to school life, the period of adolescence, and the time of entrance into the more responsible life."

### Collapse Therapy

The fundamental fact in the treatment of any type of tuberculosis is absolute rest to the part affected. The other measures mentioned above, of course, help to increase the resistance of the body forces to the infection. The diseased lung does not get proper rest by simply lying down as the breathing is going on at least 18 to 20 times per minute. These movements can only be stopped by special measures adopted to collapse the affected lung. By collapsing the lung, one gets early control of the disease, which is not obtained by any other method such as drug and sanatorium treatment. I do not want to minimise these latter, but if they are beneficial they take a long time, months or years to produce their results and even then the cures are not permanent in the types of cases we meet with here. Generally they break down again and relapse when they resume their ordinary life in the cities.

So if the early and permanent control of the disease is to be obtained then one of the various methods of obtaining collapse of the lung should be adopted. These methods of treatment have not yet received in this country the attention which they deserve. I have been practising collapse therapy for the last 18 years both in England and here and have been quite satisfied with it in many cases. I also gave my experience of it before the Indian Science Congress at Lahore [5] (1927) and at Bangalore (1932). [6]

At the latter place, I summarised the whole situation as regards collapse therapy in pulmonary tuberculosis as follows :

A strong plea is made to induce collapse of the affected lung by artificial pneumothorax in the early cases of pulmonary tuberculosis so as to get control of the infection. Much time, money and worry are saved by such a measure for every one concerned including the patient.

A cheap and portable apparatus is quite sufficient to carry out the treatment in any average dispensary or hospital in any part of the country with a little practice. All medical schools should take up this teaching and adopt measures to educate the students in the technique of carrying out this treatment. Also the whole medical profession should be made to realise the benefits of this line of treatment and should be educated in the early diagnosis and treatment

of pulmonary tuberculosis by means of post graduate courses at large hospitals and through the medical press.

The collapse of the diseased lung acts beneficially in various ways such as, simple mechanical influence by immobilisation which is known to be very effective in tuberculous disease of other parts of the body. With this immobilisation, there occurs also a marked reduction in the quantity of harmful fluids which are present in the lung; the walls of the cavities come together and unite and diseased parts get fibrosed.

Influence on the general health by the removal of harmful toxaemia is soon noticed, general health, muscle tone and appetite improve and the patient feels cheerful. At the same time excessive focal reactions are diminished and the spread of the disease is checked.

In his excellent book on Artificial Pneumothorax the late Dr. Clive Riviere, [7] under whom I worked for some time, described three stages through which the cases under collapse therapy pass :

(1) The Disappearance of Symptoms.
(2) Clinical Recovery.
(3) Anatomical Recovery.

*Indications*

I would put down from my experience that an early active case of pulmonary tuberculosis one sided or both sided is suitable for this line of treatment. I mean by activity that the patient is showing any of the following symptoms and signs [8] and continues to show them despite absolute rest, change of climate etc.

| Symptoms. | Physical signs revealed by | Clinical examinations. |
|---|---|---|
| Cough | Inspection | Pulse record |
| Sputum | Palpation | Temperature record |
| Haemoptysis | Percussion | Blood examination |
| Pain | Auscultation | Sputum examination |
| Dyspnoea | X-Rays | |
| Weight loss | | |
| Night sweats | | |
| Pyrexial attacks | | |
| Amenorrhoea | | |
| Palpitation | | |
| Dyspepsia | | |

It is said in general that pneumothorax therapy is not necessary in early cases when the case is still curable by sanatorium and other methods of treatment, but such cases are very few in our country. On the other hand no case is too advanced if it is only one sided as long as there are no adhesions which would prevent the compression of the lung. The essential factor is the softness of the lung which can be judged by clinical and X-Ray examinations. There is no reason why a bilateral operation should not be done as long as there is healthy lung tissue sufficient for respiratory exchange. We have found it of great use in many unilateral as well as bilateral cases.

Persistent cases of pleural effusions—here a gas replacement after aspiration of fluid is very successful.

If both lungs are affected in early stages or even later on in slowly progressing cases there is no harm in doing either pneumothorax on one side first or alternately on both side provided there is sufficient lung tissue to carry on the respiratory exchange [9] and the patient is not dyspnoeic. We had several cases showing complete recovery by bilateral pneumothorax.

*Contraindications*

Extensive bilateral disease with cavitation, chronic fibroid disease, tuberculous enteritis, asthma and the usual constitutional symptoms, nervousness etc. against any operative shock.

I need not go here into the details of the apparatus or of the technique of induction of Pneumothorax as these can only be learnt by practical experience in a Tuberculosis clinic or hospital. The other methods of collapse of affected lungs requiring surgical procedures are

(1) Phrenic Evulsion.
(2) Apicolysis.
(3) Thoracoplasty.

(1) *Phrenic Evulsion* is quite easy to perform under local anaesthesia and can be taken advantage of to help the artificial pneumothorax specially in basal lesions and in those cases in which owing to adhesions sufficient compression is not obtained by means of pneumo-

thorax. It induces basal collapse by paralysing one dome of the diaphragm. It may be done as an independent form of treatment or as a preliminary to thoracoplasty. It is particularly valuable in basal tuberculosis and also as an aid to artificial pneumothorax treatment to check the recurrence of effusions. Frequently it has been found that the length of the intervals of of refils can be much increased as a result of paralysis of the diaphragm. As a preliminary to thoracoplasty, it frequently happens that following this minor operation the condition has so much improved that the larger operation has been found to be unnecessary.

(2) *Apicolysis* is performed by removal of parts of upper 2 or 3 ribs at the back or in front under local anaesthesia and compressing the affected part of the lung that is the upper part of the right or left apex by means of paraffin. I saw many cases being operated in Vienna by competent surgeons. It is suitable for early special cases or chronic cases with cavities and adhesions confined to the upper part of the lung.

(3) *Thoracoplasty.* This is a more formidable operation done under local or general anaesthesia and can be only undertaken by a surgeon well qualified to do so in a well equipped hospital. It may be done in one or two stages and is suitable for cases in which the pneumothorax and other means have failed to compress the lung owing to adhesions. It is done for the disease mostly on one side, by the removal of portions of certain ribs and allowing the chest wall to fall on the lung.

## Medical Treatment

There are no drugs which have curative action on tuberculosis by destroying tubercle bacilli. Still there are many remedies which can help the patient in increasing his resistance and in combating toxaemias. Those of the former group include salts of the heavy metals such as gold and antimony and also tuberculin in a febrile pulmonary and surgical tuberculosis. Gold (Suvran vasant and gold leaves) pearly and mica preparations (Abrak, 1,000 times baked with various herbs) have been used in this country since ancient times and if properly administered so as not to produce severe reactions and if the other principles of treatment are observed as above mentioned they are distinctly of value. But many of the preparations obtained here are not reliable, are not tested and their dosage not scientifically settled. Often one of these drugs alone is taken while other principles of treatment are not observed and no wonder there are very poor results from these preparations. On the other hand when chemically known preparations like krysolgan, sanocrysin, colloid and other salts of antimony etc., are properly given in modern sanatoriums and hospitals, some suitable cases improve. We have tried these preparations and found that they are not specific but good results are due to reactions, which increase the resistance of the body. Many cases improved in general condition and had their temperature normal after the reactions, but there is nothing like permanent and speedy healing up as in the case of collapse therapy.

*Antiseptic Treatment.* Although no definite destruction of bacilli and neutralization of their toxins occur, some amelioration of symptoms is obtained by the drugs like creosote 2 to 3 ms. to 15 ms. daily with meals on cachets or palatonids or in other forms or guiacol carb. or benzosol 5 grs. thrice daily.

These can be given by inhalation also.

| | | |
|---|---|---|
| Creosote.<br>Acid Carbolic | a.a. | 2 drams. |
| Tr. Iodine.<br>Spt. Aetheris. | a.a. | 1 dram. |
| Spt. Chloroform | | 2 drams. |

Creosote may be combined with formalin, eucalyptol and oleum pini sylvesteris.

Tonic remedies which help in maintaining the resistance are cod liver oil, pure or its various preparations in emulsion form with creosote and hypophosphites combined with vitamin A and D (Vidalon) and ergosterol and its combinations.

In conclusion, I emphasize the importance of early diagnosis of pulmonary tuberculosis by X-Rays, clinical and bacteriological examinations and then taking advantage of all the methods of treatment above described specially of *collapse* therapy ( For which nearly 50% of the cases are suitable ) in fighting this white plague which is causing a great havoc amongst the younger generations ( specially the females ) of this country. *

* Read at the Scientific Section of the IX All-India Medical Conference, held at Lucknow, Dec. 1932.

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# Protein Shock or Stimulation

By N. J. MODI, M.B., M.R.C.P. (Lond.), Bombay.

Most physicians use non-specific protein therapy in their constant fight against disease, whether they use milk, casein, peptone or proteoses or proprietary preparations like 'Abijon' or xifal etc. is only a matter of detail. The constant and ever increasing use demonstrates its usefulness. But when we try to consider the why and how of its action, we enter a controversial subject. To be honest one must admit that the effects and results of non-specific protein medication are better known and understood than the mechanism of their production. IRONS in the Journal of American Medical Association has ably said that one or several factors including mobilisation of ferments, stimulation of antibodies and leukocytes or the inauguration of chemical changes in the amorphous or intercellular tissues and fluids, which affect favourably the lesion in the patient, may be responsible. As far back as 1919 WEICHARDT propounded a theory which is known as the "omnicellular plasma activation theory." STARKENSTIEN also in 1919 demonstrated an increased permeability of the endothelial-cells of the capillaries and suggested that as a result of this increased permeability, enzymes, anti-bodies, fibrinogen, thrombokinase, and glycogen are flooded into circulation and have a beneficial effect.

Some believe that the injection of proteins gives a shock and this idea has been given so much importance that this mode of therapy has been called "protein shock therapy." Professor BURRIDGE working on peptones has shown that when used in such amounts as are employed by clinicians they had a stimulating action on hearts equivalent to that which can be produced by adrenaline. He has also shown that if perfused in strengths, corresponding to those commonly employed experimentally in laboratories they show marked depressing effects. It thus seemed likely that the clinicians in their therapeutics, and laboratory workers in their experimental peptone shock made use of diametrically opposite properties of these snbstances. Consequently, it seems to me that, the use of the term 'shock' in connection with the therapeutics of peptones, has absolutely no justification, it should rather be cnnsidered as both wrong and misleading.

Milk is another agent which some use to effect what is probably miscalled protein shock therapy. If for a moment we consider the long list of diseases in which milk injections are used, mentioning a few of them *e. g.* erysipelas furunculosis, eczema, whooping cough, encephalitis, various eye diseases, acute and chronic arthritis, psoriasis, chorea, Raynaud's disease and nephritis. One observation which no body

can fail to make is that its use is not limited to either bacterial diseases, filterable virus diseases or diseases of unknown origin.

In this short paper I will endeavour to put before you some experimental evidence, which reveals it as a strong stimulant of cardiac activity, and if it can effect stimulation of hearts, it should as well effect stimulation in other organs.

I did some experiments with milk, which I have already published elsewhere. I will briefly mention a few of them which have a particular bearing to the question of protein shock or stimulation. The experiments were carried out on the hearts of Rana Indica and Tigrina, perfused in situ through the inferior vena cava. I found that when the beats of a heart perfused with a solution which held 0·6% Nacl, 0·03% Kcl, 0·01% $NaHco_3$ and 0·0025% $Cacl_2$—which is known as R/10, were feeble, the addition of a small quantity of milk to the perfusing solution was followed by marked improvement of the beat which could be maintained as long as nine hours. 0·1 c.c. of milk added to 100 c.c. of the Ringer was adequate to give definite effects and 1 c.c. of milk gave the maximum effects. The improvement which followed on the addition of milk was steadily maintained for the first six hours or so, but there-after Luciani groupings and occasional missings of beat occurred.

These effects are not only remarkable in themselves but are even more remarkable when viewed in the light of what hearts do on solution R/10 alone. A heart perfused with this solution fails within the first half hour of perfusion and these experiments with milk were begun after such a failure was actually in being. The experiments show that milk not only acts as a strong stimulant but it can maintain what it has restored. These beneficial actions of milk are in fact equal to those obtainable by similar use of adrenaline as shown by Professor BURRIDGE and SETH. I also showed that this augmentation was not due to the calcium contained in the milk.

Experiments with milk added to full Ringer solution were also performed, but before I give you the results I must invite your attention to the fact that heart beats with full Ringer solution (—0·6% Nacl, 0·03% Kcl, 0·01% $NaHco_3$, and 0·025% $Cacl_2$), are approximately of the maximum possible amplitude, consequently, simply because they are so strong little augmentation of their height can be effected. And it is to this cause I chiefly ascribe the fact that 1 c.c. of milk effects no such marked augmenting of beat, as is observed in the first series of experiments in which R/10 solution was used. But some slight quickening of the heart was observed, and a very marked influence on the maintenance of cardiac activity was obtained through milk in the full Ringer, the beats remaining strong up to the 10th. hour of perfusion, though beats began to be occasionally dropped after the 4th. hour.

These experiments show that milk is a strong stimulant. The close resemblances between the stimulation effected by milk and the stimulation effected by adrenaline, seem to me to rule out any suggestion that milk gives any thing of the nature of a shock to tissues. Instead, it should be regarded as a stimulant to tissue activity, probably acting more generally than adrenaline and also probably acting longer, because as a foreign substance to them, the tissues are unlikely to have developed mechanisms for destroying it. The term shock might not only be a misnomer to express the actions which follow a milk injection, but also be a misnomer generally when applied to protein therapy. The term seems to have been derived from the effects which followed the injection into laboratory animals of overwhelming amounts of peptone. Such amounts seem undoubtedly to be depressant, but the experimental evidence derived from experiments with peptones on hearts show that it is wrong to infer that the smaller dose such as the clinician employs, merely gives less of the depression or shock. On the contrary it would rather appear that the smaller clinical dose gives no depression at all, but is instead as stimulating as mik was found to be by me.

I accordingly suggest that the term protein-shock therapy be dropped and protien stimulation therapy be employed instead. *

* Paper read at the Scientific Section of the IX All-India Medical Conference, held at Lucknow, Dec. 1932.

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# A Plea for Early Treatment of Pulmonary Tuberculosis by Artificial Pneumothorax

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A considerable advance that has been made in the treatment of pulmonary tuberculosis is, to my mind, due solely to one cause– namely the rapid and universal development of a purely mechanical method called Collapse therapy. Artificial pneumothorax, the history of which dates back to more than a century back, is based on the soundest anatomical and physio-pathological principles. Suggested by JAMES CARSON of Liverpool for the first time in 1822, it was left for FORLALINI of Italy and MURPHY of America to make practical application of it some seventy years after. That artificial pneumothorax is the greatest advance made in the therapy of pulmonary tuberculosis, no one can seriously doubt today.

While this ingenious method of treatment has been universally applied and has achieved dramatic success in Western countries, it has unfortunately not received its due share of attention, which it richly deserves, at the hands of the medical profession in this country. Whereas the object of fresh air and rest cure is practically limited to 'incipient' cases only where diagnosis is often doubtful and spontaneous-cure is not unknown, artificial pneumothorax wins its striking success in cases which otherwise would have been regarded as hopeless ; in cases in which the lesions are extensive and symptoms marked. It is not only capable of stopping the progress of the lesions ; it is not only capable of reducing or stopping the sputum together with its bacillary content and thus making the patient a harmless member of the society, but it can restore him to health and make him fit for work. It can regain for a consumptive woman the right of motherhood who can bear healthy children and bring them up.

The object of this paper is to bring to the notice of the medical profession in this country the possibilities of this method of treatment and to hope that it will be honestly and thoroughly considered by the great body of medical practitioners who alone can get the opportunity of seeing pulmonary tuberculosis in the early stages in their general practice. Too often we see advanced cases and wonder whether artificial pneumothorax might not have arrested or, at any rate, delayed the progress of the disease.

It might be argued that many cases of pulmonary tuberculosis can be successfully treated under the conservative regime of the classical Fresh Air and Rest Cure. But from purely economic considerations that play such an important role in India, the necessity of pneumothorax treatment must be obvious especially in the case of adult people who are, as a rule, bread-winners of their families and who have neither the time nor the means to undergo prolonged cure in a sanatorium.

It has been rightly said that one who does not believe in pneumothorax treatment does not believe in rest-therapy. It is universally recognised that the most important principle in the treatment of pulmonary tuberculosis is rest. Now, granting that the patient has been put on what we may call 'absolute rest', are we sure that we have also succeeded in putting the diseased lung to rest ? The lung is an organ which, as we know, knows no rest ; it is constantly expanding and retracting atleast 20,000 times per day throughout life. It must be obvious therefore, that even if we succeed in giving rest to the body, we don't quite succeed in the matter of the diseased lung. It is here that artificial pneumothorax helps to give the necessary functional rest to the diseased organ. It stops the elastic contraction and expansion of the diseased lung during respiratory movements and ensures functional rest to the diseased areas until healing has taken place. It puts the lung of the patient and also the patient himself,

at any rate, in the stages of the treatment, under favourable conditions of rest. The air in the pleural cavity acts like a splint applied to a joint.

One great advantage of pneumothorax treatment is that it can be carried out in the midst of busy towns and cities with results which do not compare unfavourably with those obtained in sanatoriums which are, as a rule, situated in salubrious climates. While in the former case, the treatment is carried out under practically the same environmental conditions of the patient, in the case of sanatorium treatment, it is carried out under exceptionally healthy surroundings. Therefore, less chance of breaking down in the former case than in the latter when the patient returns from the healthy conditions of the sanatorium to his original environments where he got the disease.

Pneumothorax treatment should, in my opinion, be carried out in every suitable case of phthisis. No distinction should be made between the first, second and third stages of the disease. There can be no demarcation line between what may be called the 'ideal' case and the 'last-resort' case. When once crepitations are heard, the case cannot be regarded to be really in the early stage for, it must be remembered, the disease is always more advanced than the physical signs indicate and there should be no further delay in treatment. It is often found futile to try other methods of treatment because, although it may be true that some cases do well under them, others may not and even those who do well in the beginning, very frequently suffer from a relapse and then it is found to the disappointment of both the patient and the doctor that pneumothorax cannot be successfully induced either because the pleura has become adherent or because the disease has spread into the other lung. The fact is that the more the treatment is delayed, the less are the chances of its success.

It may be said against early treatment by artificial pneumothorax, that it gives rise to pleural reactions especially pleural effusion. But it must be remembered that pleural effusion is less common in early cases than in advanced and cavernous cases. Another point that might be raised against pneumothorax treatment is that it is not free from accidents and complications. It might however, be pointed out that these accidents and complications appear to be too numerous and discouraging when seen in a text-book but in actual practice they are neither so common nor so formidable.

Of the immediate complications, the two important ones are pleural shock and gas embolism. They are however, not at all common and can be avoided by using proper technique. The chances of pleural shock can be lessened by anaesthetising the whole of the needle-track by novocain solution and gas embolism can be prevented by not allowing the air to escape from the needle into the pleural cavity unless and until satisfactory negative pressure with respiratory fluctuations is obtained in the manometer. Also, no air should be allowed to enter the pleural cavity except at a negative pressure at the initial operation at least and this can be done by keeping the level of water in the 'gas-bottle' at a higher level than that in the 'pressure-bottle'.

Of the delayed comlications, one that deserves special mention is pleural effusion. Varied are the causes that have been attributed to the formation of pleural effusion. One thing however, stands out prominent--it is the involvement of the pleura in nearly all cases. In the opinion of BURRELL, the effusion is a true tuberculous exudate. When the two layers of pleura are in contact, adhesions form as a result of the lesion spreading to the pleural surface but once the two layers are separated by air any lesion on the surface is apt to be exudative in character and effusion must result. It is worth remembering also that the infection of the pleura here is secondary to infection of the lung and the reaction to secondary infection on serous surface must necessarily be a manifestation of KOCH'S Phenomenon in the form of effusion when the two layers have been separated by air.

The effect of plural effusion need not necessarily be harmful. It secures better immobilisation of the lung and auto-immunisation

of the patient—DEBOVE'S auto-sero-therapy is based on this principle. It excites productive inflammation leading to fibrosis in the lung which is one of the aims of pneumothorax treatment. It causes marked reduction in the absorption of air so that longer intervals can be given between the refills. It also helps in making the flexible mediastinum more or less rigid.

The only unfavourable effect, if it can be so called, is the onset of obliterative pleurisy. But even this need not prove so harmful as is supposed if it does not occur too early in the course of the treatment. It often helps in solving the difficult problem of deciding when the treament should be terminated and the termination is generally followed with satisfactory results.

CROCKET believes that pleural effusion which is not causing symptoms should not be touched. Its pressure, according to him, is often more effective and its presence more definitely curative thad anything given artificially. Experience has shown that in a large majority of cases there follows a very definite improvement after the occurence of the fluid and in several cases the sputum which has remained positive for T. B. until the effusion developed, either disappears entirely or it becomes negative for T. B.

The treatment of pleural effusion may be summarised as follows :

(1) If obliteration of the pleural cavity is desired, the effusion may be left alone but the patient must be watched for complaints such as marked displacement of the mediastinum or a change in the character of the fluid.

(2) If it is desired to remove the fluid *e. g.* when it is producing symptoms or when it has occurred too early in treatment, it should be replaced by air. The quantity of air introduced is generally less (about one-fourth to one third) than the fluid removed.

(3) If the fluid becomes purulent, oleo-thorax should be tried for which 10 p. c. gomenol in olive oil is used. By maintaining "complete antiseptic bath" over the pleural surfaces, the gomenol-oil reduces or completely stops the formation of pus and the patient's condition improves a a great deal. CROCKET prefers gelatino-thorax to oleo-thorax as, he thinks, this works as a satisfactory antiseptic by intermingling with the effusion and does not float on the top of it as gomenol-oil does.

(4) If oleo-thorax or gelatino-thorax fails, then the pus should be aspirated and the pressures should be kept as low as possible in order to allow the lung to re-expand. If re-expansion fails to take place, phrenic evulsion followed by thoracoplasty is the best treatment. The pleural cavity may be washed with some antiseptic like methylene blue ( 1 in 4000 ) in order to improve the condition of the patient and make him fit for the operation.

As a prophylactic measure, injections of calcium chloride and allergin have been reported to have given good results both as preventive and curative for pleural effusion following artificial pneumothorax.

Experience has shown that the end results of pneumothorax treatment depend largely on three factors :

(1) The type of the disease.

(2) The character of pneumothorax.

(3) The condition of the contralateral lung.

Of these factors, it will at once be realised, the last two are greatly within human control. If the treatment is started early there is not much chance for adhesions to form in the diseased lung and for the spread of the disease into the contralateral lung. Every advanced case of phthisis generally passes through a stage when pneumothorax was indicated and every case unsuitable today was suitable on a previous day. It should therefore, be the attempt of every physician to seize the earliest opportunity of treating his patients by artificial pneumothorax and thus prevent them from drifting into a stage when the treatment becomes either contraindicated or too late to produce the best results. WOODCOCK has remarked, "There are dangers in connection with the production of artificial pneumothorax, but the greatest—and about this let there be no mistake—is the neglect in which it is held". It is doubtful if this remark could be applied more correctly to any other country at the present moment and we cannot plead 'Not Guilty' to this charge. It is time that we bestir ourselves and make amends for the past indifference on our part. *

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# Editorial Comments

## Indian Research Fund Association and its management

In the report of the Committee on the organisation of medical research under the Government of India (generally known as Fletcher Committee) we find it remarked "It has been made evident we think that the Government Research Department and Research Fund Association have alike reached a position in which no fresh enterprises of the kinds now urgently demanded can be undertaken without some new production of skilled workers. Lack of men indeed for one reason or another is the outstanding difficulty." The Committee in its recommendations on the system of recruitment suggested the appointment of I. M. S. officers in the research departments under the Indian Research Fund Association. The advantages in recruitment from among the I. M. S. were shown thus: "The men in this service, before being employed in a laboratory have passed some years in military employ in different parts of the country. They have had experience of discipline and if they have an aptitude for research they have usually had abundant leisure and opportunity to practise it. If any of the men selected are found not to fulfil their promise for laboratory work from any cause, there is no difficulty in finding other employment for them and in that way a selection of the fittest becomes readily operative."

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These recommendations, we are sure, are based upon the evidence obtained by the Committee in the course of their enquiry. Behind this evidence we can readily study the principle which governs the management of the fund. First of all, the committee did not enumerate the causes of the lack of research workers in this country because of the fact, well known to every one, that unlike the system existing in Europe or America the task of research work is being entrusted principally to members of the Indian Medical Service or of the Provincial Service. Now during recruitment either in the Indian Medical Service or in Provincial Medical Service, it has seldom been the custom of appointing graduates of academic distinction or any one who has shown any aptitude for research. In Europe or America research workers are recruited from the honorary post-graduate workers who are allowed to work under the guidance of departmental heads of wide reputation. Only those among them who show special aptitude and intelligence in certain researches are then appointed as research workers. It is surprising that this system though economical and reasonable to all sensible men is nonexisting in India. The plea for recruiting Indian Medical Service officers for research appointments is so ridiculous that any one can understand the meaning behind such suggestion. We understand that the Governing Body of the Indian Research Fund Association have recently decided upon the formation of a cadre of research workers by doubling two-thirds of the senior posts meant for non-I. M. S. Indian workers to enable them to take in a larger number of junior Indian workers. This means that Rs. 300/- will be the starting salary of these workers. But we cannot understand how on earth they can aspire even to attain the senior cadre, if the total number of such posts is reduced, leaving, it may be noticed, the number of I. M. S. workers intact.

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It is no longer possible for the profession to accept this kind of explanation when we know that very few Indians have been offered opportunities of conducting any research independently by the Indian Research Fund Association, the power and authority of which have always been kept by members of Indian Medical Service. It has been shown in a statement of Major General Megaw, the D. G. I. M. S., in his report of the Indian Research Fund Association for the year 1930 that the following officers were research workers in the pay of the I. R. F. A.—I. M. S. 4, European J. M. D. and Sub-assistant Surgeons 11, Independent medical practitioners 37 (of whom 32 were Indians and 5 Europeans), independent non-medical workers 21 (of whom 18 were Indians and 3 Europeans). "These figures," he says in his report, "would dispel any impression which might exist that any consideration of nationality or service influenced the Governing Body in making appointments to the Research Department". Major General Megaw in giving the number of Indians and European research workers under the pay of the I. R. F. A. very wisely did not mention the salary paid to them. It is bad logic to compare the work of an Indian worker having Rs. 250/- or so as salary per month with a European worker getting Rs. 1500/- to Rs. 2000/- monthly and showing that among Indians there is scarcity of research workers. Major General Megaw further adds, "It might be unwise tot rain young graduates simply on the chance that they might turn out

good research workers." It seems that Major-General Megaw is not aware of the system of appointment to Research Institutes in Europe and America where recruitment is made not from any particular service but from among the voluntary post-graduate research workers. And in our opinion there can not be any better or more economical system, and nobody can now say that there is any dearth of such workers in this country. On the other-hand, we know, many instances where Indian workers having had distinguished research careers are wasting their talents for want of opportunity for work. In other departments of science in this country especially in connection with the universities, where the system of taking post-graduate workers exist we believe that the result is more satisfactory. If there is scarcity of medical research workers among Indians, the cause firstly, is the absolute inadequacy of remuneration (existence of a striking partiality in the pay of European and Indian worker), secondly, voluntary workers are seldom attracted by the name and fame of the heads of the Research Institutes of this country; thirdly, there is hardly any opportunity for post-graduate workers to work directly under any distinguished departmental head and fourthly, there is hardly any post-graduate research scholarship to open a career for a meritorious worker. As most of these causes do not exist in other research departments under the University, superior grades of work both in quality and originality are met with.

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The constitution of the Scientific Advisory Board and the Governing Body of the Indian Research Fund Association is such that the interest of the I. M. S. is apt to be a predominating consideration.

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In 1932- 33, out of 54 research grants 36 were given to I. M. S. and 18 only to Indians. In 1930-31 out of 45 Research grants 31 were given to Europeans and I. M. S. workers. Grants are not always given so much on the merit of the worker as on the official position of the worker. We cannot pass on without comment when we find that money granted for Tuberculosis work in 1929-1930 was spent on observation on ASCHHEIM ZONDEK test on male rats, works of similar nature having been done abroad and published in 1929 by BROUHA, HINGLAM and SIMOUNET. No one having an impartial eye can deny that there is more to be expected of Kala-azar research maintained by the Research Fund Association at a huge expenditure. If we compare the publications of the workers of the Pasteur Institute of Paris, or the State Serum Institute of Copenhagen, and other European or American Institutes where much less money is spent than the total grants of the Indian Research Fund Association we are constrained to think that it is a very poor return of the public money spent for the purpose. No one can say that the Medical Research laboratories of India are inadequately equipped. The materials for research are plenty, the Directors and heads of the Institutes are more bounteously paid and mostly recruited from British I. M. S. but yet the quality of work in these Institutes is not what should be expected.

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The recommendation of the Fletcher Committee to reserve the posts for I. M. S. is inconsistent with a genuine desire for development of research in this country. We cannot understand why there should be any reservation of posts for I. M. S. if they are supposed to be better research workers.

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We have read with interest the proceedings of the Conference held at Simla in July 1930 to discuss the location of the proposed Central Medical Research Institute and other matters. Though almost all the Indian members of the Conference, who are adequately conversant with the organisation of medical colleges and schools expressed their view point as to how the Governing Body of the Indian Research Fund Association should be constituted to serve the best interest of medical researches in India and on what basis recruitment should be made, yet the Government turned a deaf ear to these recommendations genuinely made and sincerely expressed.

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It is, we believe, waste of time to try to rectify a system planned not for the interest of training the people of this country or to utilise the best Indian intellect to solve the problem of epidemics and Public Health of our own country. It is time that Indian medical public and scientists should think over the possibility of starting medical research institutes managed by Indians preferably connected with our universities, to utilise the available Indian intellect, which is being wasted for want of adequate facility. Only in this way we shall be able to direct our researches primarily connected with our national welfare and national health.

# Medical News and Notes

[ Items of news and notes of general interest to the profession for incorporation in this section from the members of the profession will be greatly appreciated—EDITOR ]

**State Faculty of Ayurvedic Medicine in Bengal.** At a recent meeting of the Legislative Council, Minister of local Self Government, announced that the Government of Bengal had decided to constitute a Council and State Faculty of Ayurvedic Medicine. It is estimated that the total cost for the working of the Faculty would be a capital of Rs. 30,000 with an annual recurring grant of Rs. 16,236.

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**New Surgeon-General of Bombay.** Colonel H. R. Nutt, I.M.S., Inspector-General Civil Hospital, United Provinces, has been appointed the Surgeon-General to the Government of Bombay in succession to Major-General W. C. H. FOSTER, I. M. S., who is proceeding on leave preparatory to retirement.

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**Honorary System in Madras.** The Government of Madras intend to appoint a committee to report on the question of further extending the system of appointing honorary medical officers in the Government hospitals in the city, and the mofussil. One specific point that would be addressed to them is whether in their opinion such honorary officers should be appointed in addition to or in substitution of paid medical officers. The cmmittee will consist of officials and non-officials and it is rumoured that the latter will be represented by DR. P. SUBBA ROYAN and DR. C. NATESA MUDALIAR.

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**Retrenchment Proposal Dropped in Madras.** The retrenchment in the personnel in the Madras Medical Service was considered by the Local Government some months back in connection with other proposals for reduction in expenditure ; and on a decision arrived at thereon, notices of discharges were issued to about 13 of the civil surgeons who had by that time completed 25 years of service.

The Government of India, was however referred to, by the Local Government on the question of compensation to these officers who had to retire before putting in 30 years of service and the former held that compensation should be awarded to them. The Loal Government have thus dropped their proposals to carry out retrenchment in the personnel in this department from the top.

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**Leper Relief Workers meet at Salem.** A conference of all those engaged and interested in Leper Relief work in Salem District (Madras) was held at Salem on 26th. February last under the presidency of the collector. MR. K. CURTIS, Assistant Director of Survey and Secretary of the District Leper Work Council stated that the collections for the funds of the council totalled Rs. 33,792-14-6, of which the Sankari Revenue Division stood first in collection work, having been responsible for a total of Rs. 16,154-14-6. The budget for the year which showed an estimated expenditure of Rs. 44,848 during the coming year was presented and it was stated that funds would have to be found for the deficit over the existing amount of money.

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**League of Nations' Activities on Public Health.** MR. T. S. RAMANUJAM of the League of Nations Secretariat ( India Bureau ) held in Madras a group discussion with prominent local medical men on problems of public health which the League Secretariat was tracking with.

MR. RAMANUJAM explained the various activities of the League of Nations such as the setting up of the Committees and Commissions and the arranging of study tours to investigate the problems of public health the world over and of making those investigations available in the form of important literature published from time to time. He said that every country and not the least India, stood to gain by co-operating with the League in its activities. The League was now arranging to translate its literature on varied subjects in the vernaculars of the different countries and trying to introduce them in the school and college curricula.

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**Child Welfare in Mysore.** Ex-King ALFONSO opened the new building of Sri Vani Vilas Maternity and Child Welfare Centre in Mysore on the 1st March, 1933. The building is to form the headquarters for the work in Mysore.

It is interesting to note here that the first real impetus to maternity and child welfare work in Mysore was given by Rajasevadhurina Sirdar SIR M. KANTARAJORS, who dying in 1923, left by his will a sum of Rs. 1,23,000 to be devoted to the establishment of maternity and child welfare centres. The city of Mysore can boast of eleven child welfare centres now and the Municipality is now going to open five more centres at their dispensaries making sixteen in all. If the five additional centres for dealing with children between two and five years of

age are taken into account, it will appear that the child welfare movement is a very live and growing one in mysore.

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**New Women's Hospital.** H. H. the Yuvaraja of Mysore laid the foundation stone of the Women's Hospital in Yedathore New Town (Mysore) on 16th March last. The hospital is in memory of the mother of Mr. Bale Siddalinga Setty, a member of Mysore Representative Assembly and Mysore District Board and one of the foremost citizens of Yedathore New Town. He has donated Rs. 20,000 for the purpose and the Government of Mysore, the Yedatore Municipality and the Mysore District Board have agreed to find the initial equipment and bear the recurring cost of running the hospital which would serve an area of about 300 Sq. miles in extent, and a population of more than a lakh.

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**Ceylon Guarding against Yellow Fever.** At a recent meeting of the Ross Institute Advisory Committee SIR MALCOLM WATSON pointed out that yellow fever had long existed in West Africa where natives were almost immune but with the speeding up of communications by air there was every chance of the deadly yellow fever being transported from West Africa to other parts of the world. SIR MALCOLM WATSON made a dramatic declaration that if yellow fever was allowed to cross South Africa it would come to Asia and civilisation brought to a staudstill. The above declaration of SIR MALCOLM has disturbed the Colombo Medical authorities who are at present engaged in drafting a series of regulations in order to ensure immunity of Ceylon from possible infection.

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One of the regulations gives the Governor special power to interdict, by order, any air traffic from the area infected or suspected to be infected. Provision for placing infected vessels in quarantine, is also being made.

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**Control of Narcotic Drugs.** Turkey has definitely acceded to the International Hague Convention of 1912 and the Geneva Conventions of 1925 and 1931 regarding limitation of manufacture of trade, and use of opium and other dangerous drugs. The necessary legislative measures are being taken by the Government of the Turkish Republic to enforce its cabinet's decision on the following points :

1. That the re-opening of the three drug factories closed at Stamboul should be definitely forbidden, and severe measures taken against any private enterprise manufacturing narcotic drugs. The creation, in collaboration with all the Powers, of an international factory intended to provide for the world's medical and scientific needs, is the most effective way of combating the harm caused by narcotic drugs. Until such an International body has been set up, the Government of the Turkish Republic will establish in the interior of the country, under the management of the Monipolies Administration, a factory intended to provide for medical and scientific needs of narcotic drugs.

2. The constitution of a central office to deal with foreign trade in raw opium.

3. The output of opium should be limited, its cultivation supervised and subjected to special authorisation.

The purpose of these restrictions is the following :

No more opium would be grown than is necessary for the licit foreign trade and the medical and scientific needs of the State factory.

4. The absolute prohibition of the cultivation of Indian hemp, which is used in the manufacture of hasis.

5. Cases of clandestine manufacture and smuggling submitted to special courts, and special penalties provided for such criminal offences.

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**Synthetic Production of Hydrochloric Acid.** It has been known for some years that steam and chorine react in presence of carbonaceous matter with formation of hydrochloric acid and carbon dioxide. Attempts have recently been made to exploit this reaction on an industrial scale and an account of the work of Tschijik in this field appears in the "Russian Journal of Chemical Industry" 1932, No. 9, page 27.

Hydrochloric acid free from chlorine—is obtained in a comparatively simple apparatus without external heat application (the reaction is exo-thermic) using a quantity of steam 5 per cent in excess of the theoretical requirement. The degree of purity of the acid depends upon that of the carbon-containing material, and in presence of coke the product is free from arsenic and sulphur. About 10 per cent of coke is required, calculated upon the yield of acid.

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**Methylene Blue in KCN Poisoning.** It is reported that methylene blue has been proved to be a successful antidote in cases of potassium cyanide poisoning. In San Francisco a patient, having become unconscious from taking this poison, had recovered completely a quarter of an hour after an injection of methylene blue. Unfortunately details are wanting.

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**Asleep for more than a year.** It is more than a year since an athletic girl aged 27, sank into

a coma in Illinois. In February, 1932, the girl was noticed to be drowsy for a day or two and then fell into a deep sleep from which she could not be awakened.

She was first diagnosed as a case of sleeping sickness. Since then, thousands of suggestions for curing the girl have been tried and the best knowledge of science has been applied. Blood transfusions have been given and now nothing remains but to wait.

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**Woman Member in the personnel of G. M. C.** Considering that the majority of matters coming for decision before the G. M. C. concern male and female patients, two women doctors suggest in a letter to the Lancet that the G. M. C. should include a woman member. The letter states that although the number of women on the medical register now reaches a respectable figure, 5,391 out of a total of 55,932, it would not justify the claim of separate representation but experience of public bodies proves beyond necessity the advantage of having women to share responsibilities. The fact that the General Medical Council is the final authority on many issues, makes it all the more important why membership should be as representative as possible.

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**Posing as a Medical man.** PERCY SEYMOUR KELLY aged 38, a clerk by occupation, was served with a sentence of two years' imprisonment, being found guilty of obtaining money by false pretence with intent to defraud.

The prosecution case was that for over two years Kelly pretended to be a registered practitioner and on those pretences obtained credit and money by fraud. His practice was to assume a false name of a doctor in one place, obtain credit there and then abscond from that place to reappear again in some other place in an altogether different name. In one place he went to a medical agency to seek employment as a locum and he got one. There was no doubt that the defendant knew something about medicines and medical practice because he has practised his frauds successfully for some years.

The accused stated that after being educated at King's College he went to Harvard where he passed medical examinations, and in 1923 he became a doctor of medicine at the Northwestern University, Chicago. From there he went to New Guinea, the Solomon Islands, and later to Assam, where he practised as a doctor in leprosy camps. Subsequently he put ashore at Singapore, and fell ill with fever. He recovered, and the Governor's secretary asked him to bring home a certain high official ( whose name he handed to the judge ) to England. He admitted that he had worked under other doctors' names for some time. In the majority of cases however he had received excellent testimonials from those for whom he had worked.

When the jury had returned a verdict of guilty, Inspector Thomas went into the witness-box and stated that there were 34 other offences which Kelly wanted taken into consideration. There were previous convictions against him in this country ; he had been deported from the United States ef America, and from Canada, and he had been posing as a doctor for many years. In passing sentence, Judge Whitely remarked that Kelly had posed as a member of a very honourable profession. He was not qualified in his work and was a man of bad character. If he continued to pose as a doctor when he came out of prison he would be sentenced to penal servitude.

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**U. P. Board of Indian Medicine.** At a recent meeting of the Board of Indian Medicine U. P. held at Lucknow under the presidency of Hon'ble SIR SAIYID WAZIR HASAN Kt. Chief Judge of Oudh, it was decided to confer the degrees of L. A. M. ( Licentiate in Ayurvedic Medicine ) and L. U. M. ( Licentiate in Unani Medicine ) on successful students of the Ayurvedic and Unani schools under its control and the degrees of L. A. M. S. ( Licentiate in Ayurvedic Medicine and Surgery ) and L. C. M. S. ( Licentiate in Unani Medicine and Surgery ) on the successful students of the Ayurvedic and Unani colleges respectively.

The Board decided to ask the Hindustani Academy U. P. to bring out additional text books on modern lines for the use of Ayurvedic and Unani educational institutions.

A select committee of three members was appointed by the Board for the purpose of visiting institutions which had applied for affiliation to the Board. A sub-committee was also formed to consider all applications received from vaids and hakims for registration. About twenty private institutions were recognised by the Board for purpose of registration under rule 3, Schedule 1, of the Registration Rules.

A sum of Rs. 3,000 was provided for the purpose of covering the expenses of members who might undertake the work of inspection of institutions and dispensaries in the province.

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**Dr. Elizabeth Matthai Lectures 1932-33.** Under the DR. ELIZABETH MATTHAI Endowment for 1932-33 of the Madras University, Lt. Col. K. G. PANDALAI, F. R. C. S., I. M. S. delivered a course of three lectures at Hygiene Hall of the Madras Medical College, on 2nd, 3rd and 4th March last.

The subjects of the lectures were Cancer of Breast and Tuberculosis of the spine in women and chidren.

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**Scholarships for the study of Tuberculosis.** The Italian Fascist National Federation against Tuberculosis places at the disposal of the International Union against Tuberculosis, two scholarships at the "Benito Mussolini" Institute in Rome. The conditions are as follows :

The competitive scholarships, of the value of 6,000 lires respectively, plus board and lodging, are intended to enable foreign medical practitioners to stay at the "Benito Mussolini" Institute in Rome for the purpose of following a course of studies. This stage of eight months will correspond with the academic year ( from November 15 to July 15 ) namely eight months interrupted by the usual holiday periods. The scholars shall reside at the Institute.

The scholarships shall preferably be awarded to young physicians who are already familiar with tuberculosis problems and who wish to improve their knowledge of this branch of medicine. The kind of work undertaken at the Institute will be subject to an agreement between the Director of the Institute and the cadidate.

The names of candidates, accompanied by particulars as to their age, qualifications and professional experience for submission to the Union, must be forwarded to DR. S. R. MEHTA, M. B., D. P. H. (Lond.), Organising Secretary, King George Thanks-giving (Anti-Tuberculosis) Fund, Indian Red Cross Society, New Delhi-Simla (after April 15) so as to reach him not later than May 15, 1933.

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**East Godavari Ayurvedic Conference.** The East Godavari District Ayurvedic Conference met on February 5th at Tadepalli, Ramchandrapuram Taluk (Madras).

DR. D. K. BRAHMANA REDDI, L. M. F., Chairman of reception Committee in welcoming the delegates said that the Ayurveda system should be revived and made to conform to and suit modern conditions. It had to take note of modern improvements and to make use of them. To do this he advocated the establishment of research institutions, the study of physiology and anatomy and the latest methods of pathology and the use of standard medicines by all Ayurvedic medical practitioners.

After the President of the Conference, DR. RAJAVAIDYA AGNIHOTRAM VIJIASARADHY ACHARYA had delivered his presidential address the following resolutions amongst others were passed :

1. The conference requested the Ramchandrapuram Taluk Board to improve the Ayurvedic hospital at Draksharamam and to establish Ayurvedic hospitals in different places in the taluk.

2. The Executive Committee of the Provincial Ayurvedic Maha Mandal was requested to appoint a committee to conduct research work in Ayurveda.

3. It was urged that persons who had passed the Ayurvedic examinations conducted by the Mandal should be appointed as apprentices in Ayurvedic hospitals.

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**Medical School Project abandoned.** In reply to a question at a recent meeting of the Bengal Legislative Council the Hon'ble minister, in charge of the Local Self-Government Department, informed that the idea of starting a medical school at Barisal has been given up and a resolution on the subject would be published shortly.

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**Proposed Bill to Amend the Bengal Medical Act.** It is reported that a private Bill amending the Bengal Medical Act to permit the registration of Medical Practitioners who passed from non-recognised Medical Schools will shortly be presented in the Bengal Legislative Council. The similar amendment was passed in Bombay and U. P. and many practitioners have been registered under the said amended Act.

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# Medical Matters in Legislative Councils

## C. P.

The question of provincialising the two posts of the District Medical officer and the Civil Surgeon was discussed on March 8th on a token cut motion for demand under the head "Medical" (Transferred). Mr. C. B Parakh regretted that the Retenchment Committee's recommendation for the reduction of the two posts in the superior service was not accepted by the Government and he enquired why the Government should not recruit when more qualified men on less pay were available.

The Revenue Member in reply stated that the European officers considered it their fundamental right to get treated by European doctors. The Government were considering reduction of members of the Indian Medical Service to an irreducible minimum, and the talk of further reduction was useless.

## PUNJAB

The utility of the post of Director of Public Health was discussed in the above council on March 14th, under the token cut motion in the demand for Medical and Public Health.

Objection to the "cut" was taken at the outset by the Education Minister on the ground that the Director's post was non-votable.

The President, however, overruled the objection, stating that the item was shown in the votable demand, and if the Minister wanted to treat it as non-votable, he should postpone consideration of the whole demand.

The mover of the cut complained that I. M. S. officers alone were selected for the post, and opined that either there should be no discrimination or the post should be abolished.

Sir Feroze Khan Noon, replying, pointed out that the Secretary of State reserved certain posts in the provinces and this post was among them. The Director of Health's post was reserved for the I. M. S. under the orders of the Secretary of State.

The Inspector General of Hospitals pointed out that in order to safeguard careers of I. M. S. entrants who entered civil employ, certain posts were considerably reduced since 1928 and now only one such post was reserved.

The cut motion was supported by the leader of the Rural Unionist Party, stating that his party's object was to strengthen the hands of the Ministers and the Government to plead the case of the Medical Department before the Secretary of State.

## BENGAL

In the Bengal Legislative Council, on 19th March, an interesting debate centred round Mr. P. N. Banerjee's token cut motion against the demand of Rs. 5,000 under the head scheduled taxed with a view of impressing on Government, the need for starting a state lottery managed by non-officials in aid of hospitals in Bengal.

A remarkable feature of the debate was the strong support given by the European group but the Government opposed the motion on moral and legal grounds.

Eventually the motion was lost by 36 votes against 51.

## BOMBAY

### ST. GEORGE'S HOSPITAL.

The policy of the Government of Bombay in regard to ST. George's Hospital was strongly criticised in the Bombay Legislative Council, on the 7th March on a token cut moved by DR. M. D. GILDER.

Non-official members took strong exception to the hospital being opened only to Europeans and Anglo-Indians and demanded that unless an assurance was given by the Minister that he would remove this "invidious distinction" they would not be prepared to maintain it at the cost of the Presidency. It was also urged that the expenditure incurred on the institution should be reduced.

One member raised the point why the Government had not taken into consideration the Thomas Committee's recommendation to abolish the St. George's Hospital, a costly institution, and of reserving a ward in the other hospitals for Europeans. It was wrong in principle to reserve a hospital entirely for the use of Europeans.

SIR RAFIUDDIN AHMED said that on principle it was very painful to realize that whereas the Chinese, Japanese, Europeans and all others entered the hospital, Indians who were the people of the land, were excluded.

It was brought out during the discussion that out of approximately 220 beds in the hospitals, about 120 were in regular use, the remaining beds being un-occupied.

DR. J. B. DE SOUZA opposed the motion, as he thought that in comparison with the total income of the Presidency the expenditure on the maintenance of the hospital was not much. He pointed out that patients with European habits were admitted into the hospital and also Indian Christians.

Major-General W. C. H. FORSTER, Surgeon-General to the Government of Bombay, replying to the criticisms, said that there were only two ways of dealing with the question.

They must either reduce the cost, as the Reorganization Committee has suggested, or close the institution. He thought it would be wise to reserve a hundred beds for Europeans and Anglo-Indians while the remainder of the beds should be open to all communities. The accommodation in the hospital was over 200 beds.

Every effort, he added, was being made to keep down the cost of the hospital.

The Minister said the hospital came into being when the East India Company acquired Bombay. He did not find any documentary evidence to justify the hospitals being styled an exclusively European hospital. It had been always open to persons of all communities with European habits.

He agreed that the hospital should be converted into a mixed institution, provided the specified number of beds was reserved, as suggested by the Surgeon-General, and promised to place the matter before Government.

The motion was withdrawn.

### SURGEON-GENERAL'S APPOINTMENT.

An important issue in respect of the appointment of the Surgeon-General was discussed in the Bombay Council on March 8 when Sir Rustom Vakil, Minister, moved for a grant of Rs. 48,06,000.

In moving a cut to the demand DR. M. D. GILDER stated that injustice had been done to the medical profession in the Presidency. He could not understand why the Surgeon-General's post should be reserved to I. M. S. people. It should be thrown open to distinguished practitioners. Formerly the Surgeon-General was selected by the Local Government. Under the present scheme drafted by the Secretary of State who took care to suit the British Medical Council's opinion, but ignored the Indian Association's views; three or four I. M. S. officers, who formed a panel, selected a few names from all parts of India and submitted the list to the Minister, who had merely to indicate his order of preference, and the Governor General in Council appointed the officer. Thus, the Minister had no voice in the selection of his technical adviser.

Mr. J. B. Petit, supporting the cut, asked the Minister why the Surgeon-General's post should not be abolished. The speaker had been told that abolition of that post could not cause any administrative inconvenience. The Surgeon-General was merely a post office forwarding letters to the Minister, who could handle them directly. He complained that too many I. M. S. officers were being recruited. There was plenty of Indian talent available, and the Bombay Government should protest to the Secretary of State against further, I. M. S. recruitment.

Mr. Ewbank, Secretary to the Bombay Government, read extracts from the first R. T. C. report, to the effect that appointments in the future should be made on the recommendation of the Public Service Commission.

The Minister replying, said that the appointment of I. M. S. officers and the Surgeon-General invoked a constitutional issue. He asked the House to wait till the White Paper was published which, he expected, would deal with the question of such appointments.

Sir Rustom Vakil, Health Minister, Bombay Government, moved for a grant of Rs. 9 lakhs and odd for vaccination, etc. in the Council on 1st March.

DR. COLLACE moved a cut that the demand be reduced by Rs. 1,000. The speaker wanted the Surgeon-General's post and the post of Director of Public Health to be amalgamated, as the Director of Public Health could act as Surgeon-General. He emphasised that such posts should not be reserved for I. M. S. officers only, and should be thrown open to the distinguished practitioners.

Several members spoke supporting the 'cut'.

The Minister asked the House, as far as such big jobs were concerned to await the White Paper. He assured them that Government would consider the suggestions made by the members.

The cut was withdrawn.

### MEDICAL RELIEF

The Health Minister's demand for a grant for anti-malarial measures taken by the Government in the Presidency was the occasion of severe criticism of the policy pursued by the Government. One member for Kanara observed "That human beings are being treated worse than trees, that human life is not considered worth even one anna and that while people are rapidly falling victims to malaria, the Government are coldly going on with increasing tea plantations in that district, caring more for forest administration than for the well-being of people". It was stated 992 persons died in Kanara last year owing to malaria. Nearly a lakh of people were affected by malaria, but the Government was only spending Rs. 1,300 including the pay of the officer who distributes quinine in that district, while Rs. 60,000 being spent by way of allowances to Government officers there.

Mr. R. B. Ewbank, General Secretary replying said that it was impossible owing to financial stringency, to undertake any relief work on a large scale.

The Minister said that he had in view a scheme which would cost Rs. 10 lakhs for medical help in rural areas but lack of funds had made it impossible to put the scheme through.

The cut motion was withdrawn.

### ONE-ANNA FEE FOR BOMBAY HOSPITAL

Several speakers from Sind, Karnatak and Maharashtra complained about the levying of a fee of one anna from out-patients and two annas from in-patients in the hospitals. It had been admitted by the Government that they realised nearly Rs. 70,000 during the last ten months.

Members from the moffussil observed that more money was spent on city hospitals compared to the amount spent in the rural area, where the need was great.

Mr. R. R. Bakhale, Labourite, characterised the Surgeon-General's scheme of labour welfare insurance as a fraudulent one.

The Minister added that the Government had come to the decision to collect one anna per patient after careful consideration. He was surprised that his predecessor, Sir M. Raffiuddin Ahmed, objected to the levying of one anna per patient, while in his regime the principle was adopted and he had granted permission to the Poona District Board to collect the money.

Sir Raffiuddin interrupted : That is no reason why you should do it.

Sind members stated that they were not satisfied with the Minister's reply in regard to this question. So also were the Non-Brahmins not satisfied.

The Minister announced that he would ask the Surgeon-General to instruct the dispensaries not to collect fees from poor people. But who was to decide whether one was poor or could afford to pay a fee of one anna ? The House was not satisfied with the Minister's assurance. The Government issued an emergency whip and brought to the House all their members.

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# Medical Associations, Societies, etc.

Medical Societies, Associations, Unions etc. are invited to make use of this Section of the Journal. —EDITOR.

### The Bezwada Medical Association

The Association Day of Bezwada Medical Association was celebrated on the 5th March when DR. D. S. RAMACHANDRA RAO delivered an address on the "Medical Practitioner and Modern India", RAO BAHADUR DR. T. S. TIRUMURTI presiding.

After tracing briefly the history of medicine from the earliest times, the learned lecturer observed that "Healing which was once an art became, as years rolled by a science and to-day they had the science of medicine" and he pleaded for greater efficiency on the part of the medical practitioners. The public had a right to expect a higher standard of skill from the physician. It was the apathy of the Indian patient that was largely responsible for the low professional efficiency of the medical men in India. The lecturer also hoped that under the new constitution measures would be adopted providing for the Medical Insurance Scheme under which medical treatment would be ensured for every labourer at the hands of a man of his choice.

DR. T. S. TIRUMURTI while endorsing the views of the lecturer and appealed to the members of his profession, to folow up the noble ideals set out by the lecturer.

### Godavari Medical Association

The first anniversary of the Godavari District Medical Association was celebrated on the 18th instant in Cocanada under the presidentship of RAO BAHADUR DR. T. S. TIRUMURTI, after the business portion of the meeting including the election of office bearers, was over.

DR. TIRUMURTI delivered an instructive lecture on "Some Recent Advances in our conceptions and diagnosis of diseases."

Major T. S. SHASTRY, I. M. S.—the newly elected president of the Association then spoke about the necessity of conducting a leprosy campaign in the district and exhorted the members of the Association to co-operate in their respective areas when the campaign was organised.

### North Arcot District Medical Association

A meeting of the above Association was held at the Women's Medical Hospital Bunglow at Thottapalayam, on February 14 with DR. J. FINDLAY in the chair. DR. IDA, S. SCUDDER, M. D., the Principal of the Missionary Medical School for Women, Vellore, read a very interesting paper on "Salpingitis". DR. E. A. G. THOMAS gave a detailed report of two cases which were under treatment in the Women's Hospital that time. A lively discussion followed.

### Tinnevelly District Medical Association

A meeting of the Tinnevelly District Medical Association was held on Feb. 26 at Palamcottah, Captain N. S. RAMARWAMI president, DR. S. K. GANAPATHI AIYAR read a paper on "Dysentery".

### The Tanjore Health Association

The annual meeting was held on February 26th LT. COL. A. P. G. LORIMFR, District Medical Officer, presiding. The election of Office-bearers took place and LT. COL. A. P. G. LORIMER was re-elected President.

On the termination of the annual meeting, a public meeting was hele under the auspices of the Association when COL. J. WEBB, O. B. E., I. M. S., Director of Public Health, Madras, delivered an address.

This was followed by an exhibition of carefully selected health films after which the meeting terminated.

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# Annual Reports

### Pechey Phipson Sanatorium (Bombay)

This Sanatorium for women and children at Nasik Board Bombay was founded by the late Mrs. Pechey Phipson, some 40 years ago, providing accommodation on the healthy plains of the Deccan to the women and children of all races who need a change of climate from Bombay.

The Sanatorium consists of several cottages and during 1932 not less than 117 families (consisting of 549 persons) availed themselves of the Institution. The prominent feature of the Annual Report is an excess of expenditure over income.

### Infant Welfare Society, Bombay

The annual general meeting of the Society, was held at the Secretariat, Bombay, on 13th March, last.

The management is to be congratulated that inspite of the wave of economic depression which was particularly felt in the mill area, where most of the centres are situated the Society had been able to maintain in the year 1932 the level of its previous year's working in all branches of activity.

In the seven welfare centres under the Society, the total attendance of babies for milk and medicine had been 384 and 586. The total number of new babies admitted was 5,845 and 6,256 babies were visited and 100,290 revisits paid, an average of 15 visits per child. The number of women attending the ante-natal clinic had gone up to 16,156 and 40, 406 visits were paid to expectant mothers in their homes.

Subscriptions and donations during the year amounted to Rs. 6,525.

### Health of School Children in the Mysore State

The report on the medical inspection of school children in the Mysore State for the year 1931-32 shows that about 14,300 students have been examined in 18 places where medical inspection of children is compulsory. In Bangalore City, the number of students examined in the schools and colleges were 3,678 out of a total strength of 4,773. Of those examined, 1093 were found to suffer from malnutrition, 900 from defective teeth, 723 from diseases of the eye and its appendages, 421 from diseases relating to nose, throat and ear and 167 having deformities (congenital and acquired).

In the primary schools in Bangalore City, out of a total of 3,592 examined, 1240 suffered from defeetive teeth, 376 from diseases of the eye, 1,495 from diseases of the ear, nose and throat, 222 from infirmities and 70 from heart diseases.

Out of the total of 14, 300 students examined in all the places, about 4,000 suffer from diseases relating to the ear, throat and nose.

In the Bhadravati school, out of the 98 students examined, 5 sffered from malnutrition, 45 from defective teeth 6 from diseases relating to ear, nose and throat, 12 from diseases of the skin, 3 deformities, 25 enlarged spleens and so on

# Association Notes

### Hyderabad Branch (Deccan).

SIR P. C. RAY, Professor of Chemistry, was on a visit to Hyderabad for delivering Extension Lectures, delivered on March 7 last an interesting address on "The Relation between the chemical constitution of drugs and their physiological properties and recent progress in the chemistry of vitamins." Prof. HARDIKAR of the Osmania Medical College took the chair. In course of his discourse he remarked that in ancient India, Arabia and even in medieval Europe, chemistry was a hand-maid of medicine and the two subjects were closely interrelated. France led the world in chemical research, but lost its place to Germany, and to-day England and Germany were striving for supremacy in the subject. The lecturer pointed out the properties of various chemical compounds, and remarked that alcohol, which was forbidden by Islam, was sanctioned by Hindu sciptures for medical purposes. In recent times huge chemical combines had come into existence. These companies engaged the services of chemists to investigate properties of various compounds and exploit them, a matter which ought to engage the attention of Indian scientists with a view to the adoption of similar methods. EMILE FISHER had done more than any one else to carry chemical research work into perfection and his was a name to conjure with. Speaking of India, SIR P. C. RAY expressed satisfaction that in recent years India was realising the importance of chemical research. It was for the

medical profession to help the chemists by their help and co-operation. SIR P. C. RAY referred to the work of DR. GUHA of the Calcutta University, who after proceeding to England and receiving guidance from SIR RICHARD GREGORY, Editor of "Nature" had returned to India and had made important discoveries in the properties of vitamin B-1. So important have been DR. GUHA'S discoveries that foreign companies both English and American, had offered him tempting sums for rights of patent. In concluding the address, ACHARYA RAY made a fervent appeal to the younger generation of Indians. Prof. HARDIKAR remarked that SIR P. C. RAY'S presence was like that of certain chemicals, it energised and vitalised others and he appealed to the students to proceed to Calcutta and sit at the feet of the great chemist, than whom no one had done more for chemical research in India. In garlanding the lecturer, Major M. G. NAIDU, President of the Indian Medical Association, expressed the thanks of the public for having delivered the address at so short a notice.

### Suri Branch.

The first session of the Birbhum District Medical Conference organised by the Suri branch was a great success. Over 75 qualified Medical Practitioners attended besides many leading citizens of the town. DR. LALA GOLAKCHANDRA, the grand old medical graduate of the district, read an interesting address as Chairman of the Reception Committee.

In his well-written address, the Chairman, Reception Committee drew the attention of the public and authorities of the local bodies such as District Board and Municipalities to the wants and immediate needs of the District for betterment of its hygienic condition. He also pointed out the most inadequate accommodation for the indoor patients in the Sadar Hospital, its poor equipments, want of trained nurses and passed midwives which are very keenly felt by the public. He also deplored the callousness of the Suri Municipality to look after the hygienic condition of the town properly.

DR. D. N. MAITRA of the Bengal Social Service League and the Calcutta School of Tropical Medicine as President of the Conference delivered an eloquent address touching mainly upon the "Newer Ideals of health." He made it clear that modern medical men should realise the supreme importance of preventive medicine and social welfare. He also suggested the creation of a class of scientifically trained rural health workers, the "Capillary Health Worker" or "First Aiders" which would be most effective in saving thousands of lives in the district.

"In this most critical period which India is passing through at present" concluded DR. MAITRA, "everybody must do his utmost to help the nation in her struggle and you, the medical men bearing the badge of service for suffering humanity, must strive hard to uphold the health of the nation to make her physically fit to stand side by side with the other nations of the world. Turn your outlook of life from the money-making machine into the nation-making Institution."

The following resolutions were passed :

1. Resolved that the first All-Birbhum Medical Conference of 1933 give its cordial and unanimous support to the very beneficient scheme of inaugurating a Rural First Aid Service on the lines indicated by the President of the Conference in his address ; that copies of the scheme be printed and ciraulated ; and steps taken to give effect to the scheme in consultation and co-operation with the District Board and Municipality, the Public Health Department, the Surgeon General with the Government of Bengal and the local Medical Association.

2. In order to increase tle strength of the Birbhum Medical Association, all qualified registered or unregistered medical men of the district should be members of the mother organisation. Those who have qualified from some unrecognised private medical schools may be taken as associated members of the Birbhum Medical Association.

3. All members should try their best to help the organisation with regular monthly subscription and with occasional contribution of scientific papers of interest.

4. In any place where there are more than four members of the professions they should try to start a branch of the Association which will be affilliated to the centre. In this particular case the branch will have to contribute a part of the sum to the District Association in return of the help givien by it.

5. Every year there shall be an All Birbhum Conference regularly inwhich all members will try their utmost to bring interesting cases aud papers on interesting subjects for general discussion and this conference will be held in rotation at different places of the district.

6. That the Government be requested to strat a Filarial Research Centre in the district which is the endemic home ot filarirsis as it has been done in Puri by Behar and Orissa Government.

7. That the local bodies be requested to appoint trained midwives in town and every Union Board to attend free of charge.

8. That local bodies should start a Baby and antenatal clinic in the towns of the district, like Bolpur, Rampurhat.

9. In view of the fact that spas and baths in the west go a great way in helping our treatment of many diseases, the Medical Practitioners in a body should start a spa and bath treatment at Bakreswar.

10. In view of the increase in number of Tubercular cases in the district, Government be requested to remove the special tubercular ward of the Jail from the heart of the town to a distant locality beyond the ambit of injury to the public health.

11. In view of the fact that there is a large number of lepers in the district and they are helping the spread of the disease the authorities of the Municipality and the District Board be requested to start a centre for leprosy treatment outside the municipal area.

12. In view of the fact that Dentistry is the crying need of the district, a dental department be started in the Hospital with every outfit.

13. Radiography and electric treatment be started by the local bodies in the Sadar Hospital.

14. The honour, dignity and interest of the Indian Medical Profession demand that the Indian Medecal Bill, which will be taken up in the Assembly by the second week of February, be rejeted in toto or amended in accordance with recommendations of the Indian Medical Association, already forwarded to the members of the Assembly.

15 In order that the Medical Officers of the District Board may pick up the knowledge of up.to-date advances in the medical and surgical sciences, this conference urges upon the District Board to depute the Doctors working under them for post-graduate training at Calcutta and allow them a promotion after passing.

16. In view of the very poor scale of pay allowed to the Medical Officers working under the District Board, this Conference requests the District Board Authorities to adopt a suitable scale like other districts.

17. The district, Local bodies be requested to invite help from the Association in time of epidemic.

18. In order that our profession may run *pari passu* with the scientific progress, all medical practitioners should try their best to start a central Bacteriological and Pathological laboratory in the district.

19. While appreciating the benefit done by opening several centres for the treatment of lepers, this Conference urges upon the District Board to increase present scale of allowance given by the District Board per hundred injections as is done in the East Bengal Kala-azar centres.

20. That all the heads of the Educational Institution of the district be approached to start a First Aid and Nursing Class in every school of the senior students to enable them to be of use for social service.

At night DR. MAITRA delivered an interesting and impressive lecture on the lessons of his European tour describing the Child, Women, Adult education, and Health and Social hygienic movements, Sokol and Youth movements in different countries of the West such as Russia, England, Zecho-Slovakia. The lecture was illustrated with the Lantern slides and was largely attended.

The entire success of the occasion was due to the untiring energy of DR. B. C. MITRA, M. B., Secretary Reception Committee, DR. K. G. BANERJEE, M. B., Secretary District Medical Association and DR. S. C. MUKHERJEE

### Poona Branch.

The following resolutions were passed at a General Meeting of Medical Practitioners held on the 19th February 1933 under the auspices of Indian Medical Association ( Poona Branch ):

1. This Meeting of the Medical Profession in Poona strongly protests against the Indian Medical Council Bill brought forward by Government in the present Session of the Assembly as unacceptable in its present from and urges the postponement of the consideration of the Bill till the inauguration of the contemplated New Constitution or amend the same in accordance with the wishes of the Profession as expressed from time to time."

2. "This Meeting authorises its Chairman, Khan Bahadur Dr. E. S. Bharucha, L. M. and S, F. C. P. S., B. M. S. (Retd), to send copies of the Resolution passed by this Meeting to Members of the Legislative Assembly representing Bombay Presidency and a telegram in advance to the Hon'ble Khan Bahadur Mian, Sir Fazl-i-Hussain Kt. Member in charge of Education Health and Lands."

# Medical Examination Results

### Seth Gordhandas Sunderdas Medical College

The following students passed the M.B.B.S. Examination of the Bombay University from the Seth Gordhandas Sunderdas Medical College, in January 1933.

| | |
|---|---|
| Ajynkya Y. N. | Koppikar P B. |
| Akbar Ali | Mandalia N. C. |
| Chaudhari S. R. | Mehta C. B. |
| Demello E. R. | Munshi H. T. |
| Gokhale T. K. | Miss Mahajan S. V. |
| Khare H. T. | Desai S. D. |
| Karmarkar V. A. | Ranade S. N.. |
| Miss Jadhao M. K. | Shadbhag M. A. |
| Kazi I. K. | Taore K. A. |

Vyas T. P.

### Burma Medical Examination Board, Rangoon

The following candidates are declared to have duly passed the final Examination of the Burma Medical Examination Board held in March, 1933 as detailed below. The name are in alphabetical order.

| | |
|---|---|
| Aboo Baker | Miss D. Kanamal |
| C. S. V. Ayyar | I. S. Kumar |
| H. K. Baidya | La Myen |
| Brahm Nath | Maung Atwe |
| N. C, Chakraburty | K. S. Mazumdur |
| R. Chowdhury | R. L. Mazumdar |
| A. B. Deb | A. C. Paul |
| N. R. Dhar | B. Pershed |
| J. P. Dorairaj | Miss. D. Rozario |
| V. Hari | B. L. Sharma |
| K. H. tain Hoke | H. Seshan |

G. Venkata Rao.

# Current Medical Literature

## MEDICINE

### Scaleniotomy as an adjunct to Collapse Therapy

L. FISHER (Am. Rev. of Tuberc., Dec., 1932, Ref. Colorado Med. March, 1933) summarises the results of 31 scaleniotomies as follows :

Scaleniotomy is an useful adjunct to collapse therapy in a certain proportion of cases of pulmonary tuberculosis.

The effect is probably one of relaxation rather than of true compression, though a negative sort of compression is obtained by elimination of the upward inspiratory pull exerted by the first and second ribs upon the apex of an adherent lung. Slight narrowing of the upper hemithorax has been shown.

In the series of 31 cases, some persistent cavities were closed or markedly reduced in size within a few weeks ; other cavities which were sub-pleural, were definitely flattened by costal drooping.

Symptomatic improvement was immediate in most cases. Cough and expectoration were consistently diminished. Recurrent haemoptysis was prevented and rapid reduction of temperature to normal occurred. *J. C. B.*

### Selective Therapeutic Pneumothorax in acute Pulmonary Suppuration

R. A. BENDOVE (Amer. Jour. Surg. Vol. XIX, p 49, Jan. 1933) advocates selective pneumothorax in recent cases of lung abscess when the lesion is soft and plastic, whereas in late stages the presence af marked fibrosis and pleural adhesions render such a pneumothorax inapplicable. The air introduced into the pleural cavity will, in recent cases of suppuration, localise over the diseased portion of the lung and immobilise it, allowing at the same time the non-diseased portion to expand almost to the periphery during inspiration, stimulating drainage, entailing little respiratory and circulatory changes and causing very little discomfort to the patient.

The amount of insufflation should vary from 150 to 250 cc. and the intervals from 3 to 5 days. With improvement, the periods between refills are increased. The collapse is maintained for at least 3 months after the abatement of all subjective symptoms. The author, however, points out that every case of acute pulmonary suppuration should be treated expectantly for 4 weeks after a definite diagnosis has been made. *J.C.B.*

### Resolving Exudates in Pulmonary Tuberculosis

H. S. REICHLE (Amer. Jour. Dis. Child 2 : 307, 1933) from a review of the literature as well as from personal clinical and pathologic experience, concludes that the resolving lesions in pulmonary tuberculosis are of three types (*a*) simple atelectasis (*b*) non-tuberculous lobar or broncho-pneumonia (*c*) retrogressive tuberculous lesions. Probably the last one predominates in relative incidence. Complete resolution is possible in almost every form of tuberculous inflammation.

Clinically the only reliable criterion for the diagnosis of the retrogressive type of tuberculous pneumonias is the course of the disease. *J.N.D.*

### Improvement in Nervous and Mental States under Cortin therapy

F. A. HARTMANN, G. M. BECK and G. W. THORN (Jour. Nervous and Mental Dis. 1 : 77, 1933. Rev. Med. Times 3 : 13, 1933) report the use of cortin (adrenal cortex extract) in the treatment of cases of nervous or muscular fatigue and exhaustion. Cortin was used at first only in cases of Addison's disease with nervous and mental symptoms but subsequently it was used also in cases with symptoms of neuro-muscular fatigue but with no definite evidence of adrenal insufficiency. The cases treated include 3 cases of Addison's disease, 3 cases of nervous or muscular fatigue without organic neurologic change and 5 cases of definite organic neurological lesions accompanied by muscular weakness. These cases all showed definite improvement varying in degree. Not only were the motor functions improved but there was also a favourable change in the mental status. Fatigue was diminished with a concomitant increase in strength. Myotonic manifestations and fibrillation if present were definitely diminished. In the cases with organic neurological lesions, there is evidently no real change in the organic state. In Addison's disease, the response of the neuromuscular tissue is to be attributed to the relief of adrenal insufficiency the improvement is attributed to the pharmacological action of cortin. *J. N. D.*

## SURGERY

### INTERNAL DRAINAGE

### Its significance in the prevention and treatment of postoperative pulmonary atelectasis

M. L. LUBIN ( Amer. Jour. Surg. Vol. XIX, p 81. Jan. 1933 ), as a result of his clinical, radiological, and bronchoscopic investigations, summarises his observations as follows :

(1) The prophylaxis and treatment of postoperative pulmonary atelectasis demand a

clear understanding of the mechanism of its etiological factors, viz, internal drainage.

(2) By internal drainage is meant the movement of secretions from place to place within the tracheobronchial tree so that bronchi are occluded and infection is spread. The movements of tracheo-bronchial secretions are dependent on the posture of the patient, the nature and quantity of the secretions, and the size and course of the bronchial stems.

(3) Buccal and nasal secretions, by gravitating into the tracheobronchial tree even during the presence of the cough reflex, play a significant role in the production of pulmonary atelectasis and pneumonia.

(4) The early recognition of post-operative pulmonary collapse is important for two reasons : first, it allows early treatment and prompt recovery, secondly, it obviates the dreaded post-operative pneumonia supervening on a collapse of longer duration.

(5) The adoption of suitable postural exercises, and the use of carbon dioxide inhalations and expectorants are of proven value in the treatment of postoperative pulmonary atelectasis.

(6) Bronchoscopic aspiration, in special cases, is a valuable method in the prophylaxis and treatment. *J. C. B.*

### Alcohol injection for prolapse of the rectum

EUGENE B. POTTER and JOHN. M. WELLMAN ( Amer. Jour. Surg. p. 297, Feb. 1933) having recorded the good results of injection of alcohol in a small series of cases of prolapse of the rectum, prefer the injection method to the operative form of treatment. They advocate the technique described by FINDLAY :—The lower bowel is emptied by an enema, and the patient anaesthetized, usually with nitrous oxide and oxygen. If the prolapse is down, it is reduced and the perineum is prepared with iodine and alcohol. The finger is inserted into the rectum to serve as a guide, and a long aspirating needle (calibrated in centimeters) is introduced into the perirectal tissues on both sides of the rectum, to a distance, of 7 to 8 cm. The punctures in the skin are made about 0·5 cm. lateral to the anal margin, and the point of the needle is guided to a position just out-side the rectal mucous membrane. Alcohol 1·5 to 3 c. c. is injected on each side. A pad is placed in the perineum and the buttocks are strapped firmly together, recumbency being maintained for seven to ten days on a Bradford frame, during which time the child is kept on a diet of boiled milk. If the bowels move before a week, the recumbent position is not altered, and the faeces are allowed to escape round the pad which is then reduced. *A. N. R.*

## OTO-RHINO-LARYNGOLOGY

### Lipiodol Injection of Nasal Sinuses

C. E. EARNEST (Colorado Med. p. 77, March 1933) concludes as a results of his experience the following :

1. The use of iodized oil is of advantage in the diagnosis of obscure sinus conditions.
2. Instillation of lipiodol causes little or no discomfort, often benefit.
3. The upright position gives definite levels of fluid and better interpretation of the pictures.
4. Three positions should often be used for X-ray, the lateral often stereoscopically.
5. Asthmatic conditions and many other systemic conditions are markedly benefited when diseased conditions of the sinuses are relieved. *J. C. B.*

## RADIOLOGY

### The Roentgen appearance of the chest of the new born infant

J. T. FARREL (Am. J. Roent. 24 : 140, 1930 Rev. Amer. Jour. Dis. Child 2 : 385, 1933) presents the results of a series of roentgenograms of the chests of 159 infants made within forty eight hours and again on the tenth day. Roentgenograms of some of the children were made for the third time at 6 months of age. The still born infants' chest could not be distinguished from the abdomen and no differentiation of heart and lungs was present. In expanded chest after birth and aeration the individual organs, including the great vessels and often the thymus were differentiated. The spine was quite straight in the lateral view and the average width of the chest was 9 cm. and the average length of the chest was 5 cm. In about one third of the children the thymus was seen. No appreciable change took place in the contour of the chest or heart in ten days. The striking observation in the roentgenogram of the children at 6 months of age was the similarity in the configuration of the thorax and the thoracic organs to that seen in the same infant at birth. *J. N. D.*

## PATHOLOGY

### Action of the Parathyroid Hormone on the Epiphyseal Junction of the young Rat

H. SELYE (Arch. Path. 14 : 60, 1932. Ref. Amer. Jour. Dis. Child. 2 : 375, 1933) inoculated ten day-old rats with large doses of Para-